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FINANCE ENGINEERING COMMERCE

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Vol. XXIII June, 1927 No. 6

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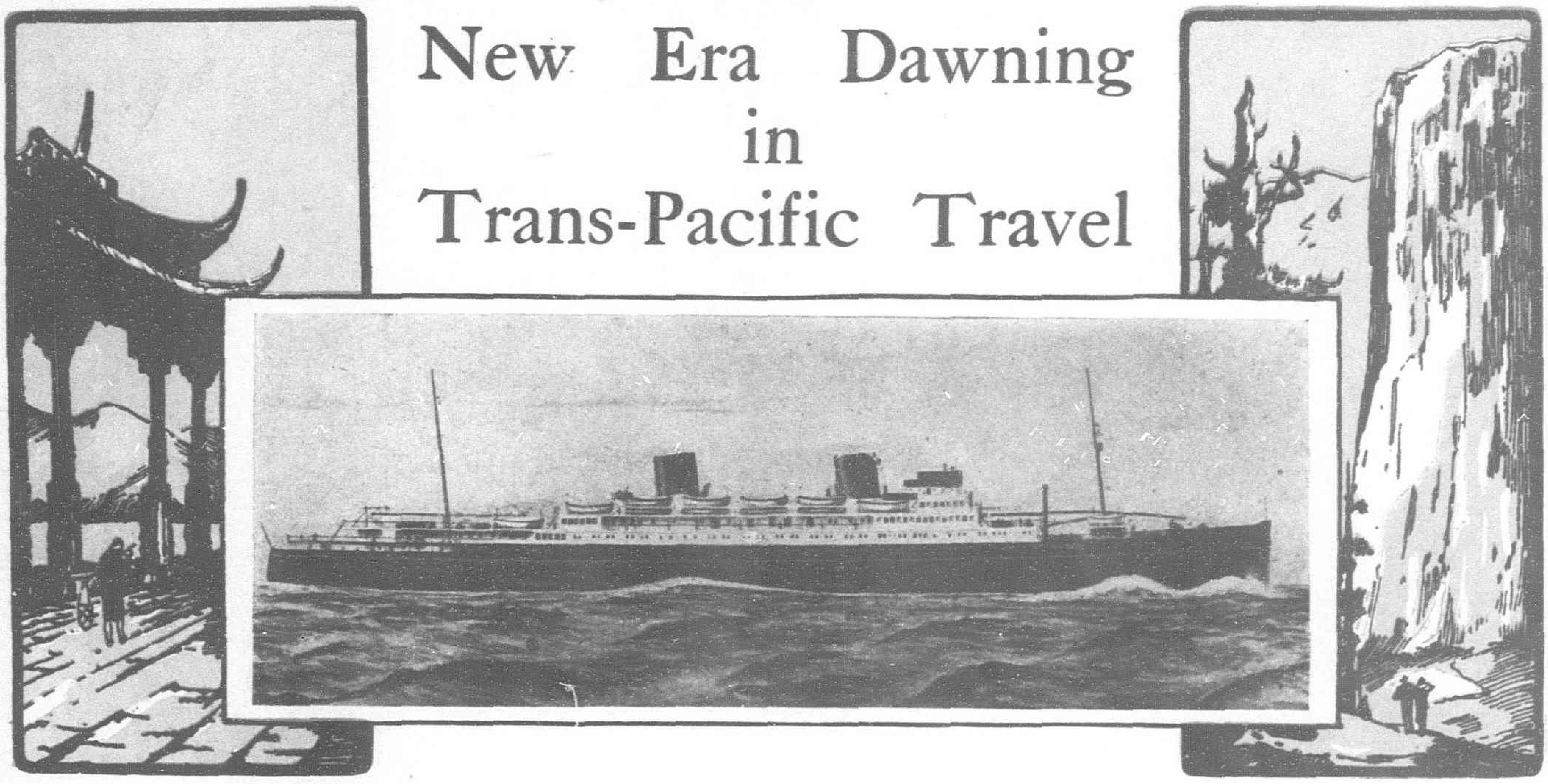

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The Far Eastern Review

ENGINEERING FINANCE COMMERCE

VOL. XXIII SHANGHAI, JUNE, 1927 No. 6

Japan's Problem in China

PROTESTS are being made in Nationalist circles against the landing of a Japanese force in Shantung. Dr. C. C. Wu, representing the Nanking Government, Mr. Eugene Chen, representing the Hankow Government and Dr. Wellington Koo, representing the Peking Government, have made their protests. They object of Japanese troops and to the protecting by Japanese troops, of the Shantung Railway. Similar protests were made when the British troops were sent to Shanghai. Similar protests will always be made when any foreign troops are landed in China. These protests are both real and *pro forma*: the Chinese may be fighting each other and they may be destroying their country ruthlessly, but they object to any and all forms of foreign intervention. That much may be taken for granted, from the Chinese standpoint.

From the foreigner's standpoint, the problem presents a somewhat different angle: it is now generally admitted by the Nanking Government that the Nanking outrage was the result of Communist efforts in Nanking and that the foreigners there were attacked not because foreigners are hated by the Chinese people or unwanted by the Nationalist Government but because it suited the Hankow Communists to make it difficult if not impossible for General Chiang Kai-shek to have any relations with the foreigner's in China whose largest single interest is the Treaty Port of Shanghai. It becomes perfectly clear then that had Shanghai not at the moment been in the possession of an international military body, consisting of British, American, Japanese, Italian, Dutch, Spanish troops and volunteers of many other nationalities with a huge armament of gunboats in the Whangpoo River, Shanghai would have shared the fate of Nanking. And there is this to remember that had the Communists been successful in Shanghai, there would to-day be no genuinely Nationalist Government in Nanking and there probably would have been an interventionist movement on an unparelleled scale. From that standpoint the presence of the foreign marines and troops in Shanghai was a prophylaxis which has worked untold good for the Chinese people, who object to both Communism and Intervention.

The situation in Shantung is somewhat different. Although the Communists are no longer riding on the crest of the wave, they are by no means dead. They seem to have sufficient vitality to hold on to their territory about Hankow and although Mr. Borodin has many times been reported dismissed and fleeing, he is still in Hankow and is apparently seeking to enter Peking a conquering hero in the wake of the erstwhile Christian General Feng Yu-hsiang. If Chinese Communism were Chinese, one might perhaps find some excuse for it on the general assumption that a people may go mad if they so elect. But with Borodin controlling Hankow and seeking to control the North through General Feng, those who have major interests in North China have a definite right to protect themselves.

Japan Not Seeking Spoils

The argument that China is in the throes of revolution and that therefore foreigners live and do business in China at their own risk, is a fatuous bit of logic born of a propagandist mind. The basis for this assumption is the right of any people to determine what form of government they shall enjoy, but at the same time during all revolutions, other nations have sought to safeguard their treaty rights, their property rights and the lives of their nationals in the disordered country. That they have not always succeeded entirely to achieve such protection has never established the principle that they have no rights to such protection.

In the case of China, the country has been in the throes of revolution intermittently since the Taiping Rebellion. Soon after the foreigners from the West arrived in China, there was already war between North and South, between that Government which acted from Peking and those peoples who came from Kuangtung and Kuangsi. All of China's unequal treaties are the result of the break-down of government which normally attends revolutions. In spite of constant warfare, of rebellions and the suppression of rebellions, of subversive movements and the decay of a dynasty, the foreigner has been able to develop a trade and industry, a political status for himself and a contractual relationship between China and the West, which from every standpoint has been of service to the Chinese people. The change of attitude of the western Powers from the Treaty of 1842 to the Washington Conference has been gradual and has clearly represented a westernization of China's thought and governmental methods. This process is slow and because of the hugeness of the size of China and the complex character of the Chinese people, only the intellectual surface has been scratched. But everywhere there is sympathy with China and an unwillingness to take advantage of her weakness during this growing period of revolution and disorder. Were there different sentiments, not two thousand troops would have been sent to Shantung but two hundred thousand, for the occupation of any part of China would be child's play to a great and modern power. That China is not occupied is due almost entirely to an unwillingness to force upon the Chinese people a system and a government to which they might object. Sir Austen Chamberlain once expressed the opinion of all Powers when he said that he was thinking about a hundred years from now.

The position of Japan vis-a-vis China is an unusual one, more serious, more important, than that of any other nation. Japan was once a backward nation as China is to-day, held in political subjection by unequal treaties, regarded of a different race, as a less important race than the Nordic conquerors who forced her Shogun to sign a treaty with the conquerors. In a short space of time Japan discovered the processes which made the westerners so mighty. Japan reforged her characteristics and methods. As Dr. Hu Hsih so wisely said, Japan changed from a rickshaw to a motor car civilization. Japan forced the Powers to recognize her equality by producing a modern state which by the time of the Versailles Conference had achieved an equality with the first five nations of the earth.

Japan Wins Recognition for Asia

Indirectly all Asiatic nations have benefitted by Japan's preeminence because it definitely meant that not Europe alone would dominate the world but that Asia would have a voice. And although Japan's economic and political interests may have thrown her into the arms of Europe, the fact remains that Japan has ever sought the upliftment to equality of all Asiatic nations. There is at this moment such a strong pro-Chinese movement in Japan that it is unmistakable and is based not upon political or economic self-interest but upon racial kinship and a sense of justice. It is this sense, this popular movement which assures China that no matter what Japan may do to protect Japanese life and property in China, not one inch of China's soil will be taken from her in this her moment of greatest historical weakness. *But just as Japan has no intention of lessening China's territorial possessions, so must no other nation, Asiatic or European, be in a position to take advantage of China's weakness. Soviet Russian imperialism has already resulted in a loss to China of Mongolia. Can Japan afford, or is it right that anyone should expect it of Japan, that China should lose Manchuria or any other part of North China to Russian imperialism?*

These generalizations apply to the whole of China, but in Shantung Japan has a more specific interest. Japan joined the Allies during the Great War and fought a naval and land battle at Tsingtao. The German colony at Kiaochao, which was to be used as a naval base against the Allies, was won by Japan was a prize of war. The German rights and concessions in Shantung province came to Japan by right of war. Whether it was wisdom to hold these possessions as Japan did or whether there would have been an advantage in an earlier return of this territory to China, is within the realm of theoretical mass psychology. The fact is that Japan won this territory in a war and ceded it back to China as a result of negotiations. The treaty by which Japan's rights in Manchuria were returned to China is binding upon China.

The fact that Dr. C. C. Wu, Mr. Eugene Chen and Dr. Wellington Koo who are in utter disagreement with regard to the internal affairs of China, protest simultaneously against the landing of Japanese troops in Shantung, indicates beyond a shadow of a doubt that in international relations, China is as one. Therefore, the treaty is binding upon the whole of China and no party can utilize the pretext of revolution to ignore it. Article VI of Appendix 11 of that agreement clearly states:

> The Chinese Government assumes full responsibility after the withdrawal of Japanese troops for the protection of life and property of Japanese residents in the Railway Zone, as well as the policing and protection of the railways, mines, telegraph lines and properties appurtenant thereto.

Now, here is a question for political interpretation. It may be suggested that Japan should wait until after Tsingtao and the Railway Zone has been shambled and that then she might send in troops to restore order. In a word, that neutrality, friendship for China, should be stretched to the limit. But is it not greater wisdom to send the troops into Shantung as an emergency measure and then to withdraw them as soon as it is shown by acts that the oncoming Nationalists will not invalidate the letter and spirit of the article of the treaty quoted above.

It may be suggested that the Nanking Government has already shown by its attitude in its own territory that it will not tolerate Terroristic Communism. But it cannot be altogether certain that it will be Nanking's troops who will occupy Shantung in the event of a northern defeat. Marshal Feng Yu-hsiang is at Chengchow and it is understood that he has promised the province of Shantung to General Chin Yun-ao, who commands an irresponsible rabble of ex-Chihli Army soldiers and bandits who have recently come under the influence of the Hankow Communists. General Tang Seng-chi might fight his way along the Lunghai Railway and enter the province if he can defeat the forces of General Chiang Kai-shek. The Shantung troops themselves might rise in their wrath and loot the province which they can no longer hold. In a word, even if one wholeheartedly supports the Nanking effort toward moderatism, toward a genuine establishment of a Kuomintang government, all other factors have to be taken into consideration. And as Japan has still a huge investment in Shantung, Japan is entitled to protect that investment, particularly as she might have held the sovereignty of the area, which she voluntarily returned to China in the hope that such an action might end an unfortunate political situation and help to stabilize the country.

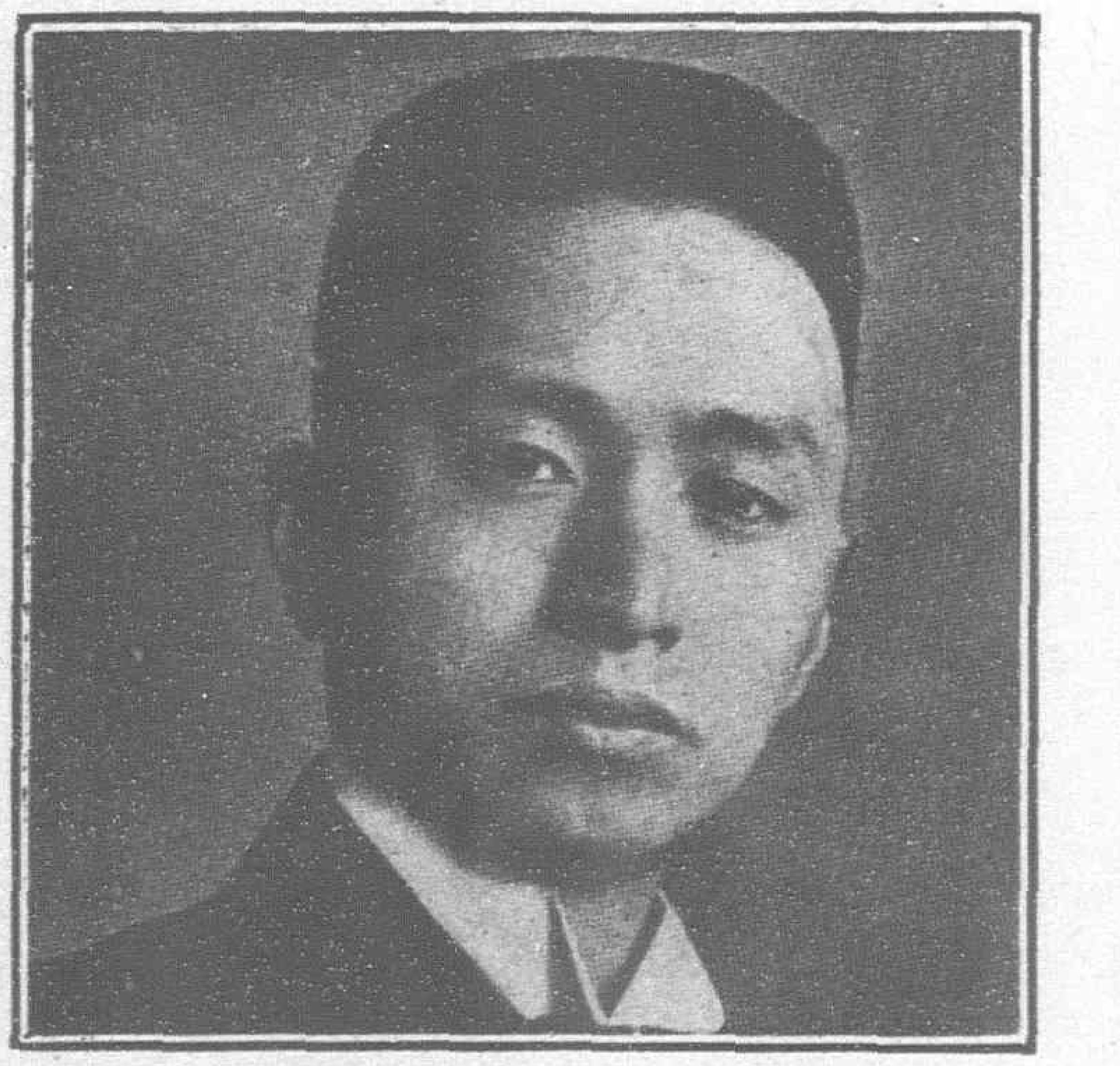
There is one other point: some of the Nationalists believe that Japan's purpose in sending troops is to assist Marshal Chang Tso-lin to hold this territory. It is impossible to believe that Japan has any such intention. It is impossible to believe that Japan would at this time break her long-lasting neutrality as regards the various political parties of China. Surely, Japan has shown, thus far, that the masses of the Japanese people are not unsympathetic with the Kuomintang's efforts to establish a modern China. Not in Shanghai, nor anywhere else in China, have Japanese troops been used for the purpose of bolstering up the Northerners or any other group in China. Were such Japan's intention, it would have been simpler to effect a Nationalist defeat in Kiangsu than to wait until a clash took place between Nationalist and Japanese troops in Shantung. There is no need to fear such a possibility. **It becomes increasingly obvious that the Japanese troops will only be used to protect Japanese life and property and the railway zone in accordance with Japan's treaty right and if there is no further necessity for the presence of Japanese troops, they will be withdrawn. Japan wants no trouble in China, but Japan is going to protect herself against being involved in a world war on account of China.**

Official Statement

Japan's official statement on the subject of the troops makes it perfectly clear, that the troops are sent for protection not for occupation. The statement follows:

Taking into consideration the fact that, owing to the present commotion in China, in which we remember especially the incidents that occurred in Nanking, Hankow and other places, arising from the imperfect protective measures taken by the Chinese authorities, the lives and property of our nationals resident there, were subjected to grave danger and injury, and this country even suffered an indignity, it is not improbable that under the present circumstances similar unfortunate incidents may occur in North China where disturbance is imminent. The disturbances are now feared to spread towards Tsinan and we feel profound anxiety about the safety of the lives and property of Japanese residents there. They

CHINA'S MINISTERS OF FOREIGN AFFAIRS



Dr. Wellington Koo, Peking

Dr. C. C. Wu, Nanking

Mr. Eugene Chen, Hankow

number as many as two thousand and, as the district is situated inland far from the coast, it is impossible to protect them with naval forces as in the case of those in the Yangtze Valley. In order to prevent the recurrence of unhappy events, therefore, the Japanese Government are compelled to protect the lives and property of their nationals with military forces. In view of the fact, however, that arrangements for the dispatch of troops to effect such protection naturally require a considerable space of time while the situation of warfare changes every minute, it is decided to dispatch immediately as an emergency measure a force of about two thousand men to Tsingtao from the Japanese Garrison in Manchuria.

This protection of our residents by military strength is a matter of pure and urgent necessity demanded for the self-defence and security of our nationals and by no means implies any unfriendly intention ; toward China and her people, nor is intended to interfere with the strategic operations of any of the Northern and Southern troops and hinder their military movements.

The Japanese Government, therefore, declare that, although they despatch troops as an unavoidable measure of self-defence as above stated, they have no intention whatever of keeping them for a prolonged period and the troops will be wholly withdrawn immediately the fear of danger to our residents in that region ceases to exist.

What is the Game?

Why Has Soviet Russia Spent So Many Millions on the Christian General?

MARSHAL Chang Tso-lin's troops one day marched into the Legation Quarter, entered the Russian Embassy grounds, arrested a number of Russian and Chinese Communists and seized a large quantity of documents. These documents are being revealed to the world photographically as the translators complete the task of turning into Chinese and English, the Russian in which they are written.

General Feng Yu-hsiang

The documents clearly show the relationship between Soviet Russia and Canton and Feng Yu-hsiang, the so-called Christian general. They show beyond a shadow of a doubt that Russian agents participated in China's internal affairs, organized and reorganized political groupings and exercised a controlling influence over some of the most prominent men in the country. The documents show the enormous war-like activities of Soviet Russia in China. They indicate that Soviet Russia was preparing a Chinese Army to serve its purposes. The question is : What were these purposes ? Was it the conquest of China by a Chinese Army in the interests of Soviet Russia ? Was it the building up of an enormous army in China to fight foreign nations ? Was it aimed only at Great Britain or at Great Britain and Japan ?

Take for instance Document 14, most of which we herewith publish. What are all the officers' schools for ? Why does Soviet Russia bring together such incongruous factors as the Kuomintang and the feudalistic Feng Yu-hsiang ? Why do the Russians arrange to have members of the Kuomintang Party who were associated with Dr. Sun Yat-sen expelled from the army ? Is it not interesting that the men on the spot continually ask for more and more assistance from Soviet Russia ? What is the game :

Herewith Document No. 14 :

(Pages 1 and 2)

Very confidential

REPORT OF THE WORK IN THE 1ST KUOMINCHUN.

By what means the work was carried out.

At the end of April—beginning May, 1925, our group of military instructors consisting of . . . . .? military instructors, 2 political-military instructors, I doctor and 4 interpreters arrived at the 1st Kuominchun Army.

(In ink)
Keep this in the files. There are annexes No. 1, 2, 3, 4.

All changes which took place later on may be found in the annexed list of our instructors who have ever been in the Kalgan group. (See annex No. 1).

Main changes in the staff occurred during the periods from July to August when Lapin (?) and Putna left the group, from September to October when a group of 8 junior cavalry instructors arrived at the group.

Printed : 6 (copies)

For Ivanovsky	1
K (probably Karakhan) with annexes.	1
Henkel	1
Liharin	1
In the files	1
Initialed " S "	1

The copy given to Com. Henkel is marked 14 III 1926.

During the period February-March, 1920, the total net decrease of the group was 16 men, some of which were sent to Canton, and the rest were returned to the U.S.S.R. on account of bad health or went on leave.

At present there are in the group 21 military instructors. 2 political-military, 13 interpreters (see annex No. 2). The following of them are due to be shortly sent back to the U.S.S.R. : Henkel, Brodi, Dutren...and Solovieff.

By order of K (Karakhan ?) I request you to let me know, for submitting to him, the objections, additions, and remarks you have to make to this report.
Initialed " S "

Before the group of our instructors was sent to the 1st Army, no material help had been entended by us to it. During the period from the arrival of our instructors to the end of March., 1926, we issued to the Kuominchun arms to the amount of about 6 millions of roubles, including freight—about 26 thousand rifles, 100 (or 400 ?) machine guns, about 21 million cartridges, 24 field guns, about 22 thousand shells, 10 trench mortars with 1,000 bombs, 10 thousand hand grenades, 1,000 swords, 500 lances, 3 aeroplanes with bombs and machine guns. (See annex No. 3).

WHAT HAS BEEN DONE.

1.—*Three armored trains were built* and the 4th is being constructed. The crews of the first three trains were trained by our instructors. These crews, as has been proved by experience in battles, are working well. Three of our instructors are doing this work.

2.—*About 20 cannon* and several machine guns were repaired.

3.—*The following school work has been done.* According to the plan proposed by Com. Putna and changed by Feng with regard to the students who should enter the schools (Putna had proposed to take the middle aged commanders of companies and regiments, Feng decided that the junior ones should be taught), the following schools were opened when Putna was still there :

The Cavalry School. 70 officers and 170 non-commissioned officers were instructed. The instruction lasted from the 10 VI to the 5 x-1925.

The Artillery School. 114 officers, destined to become commanders of platoons and batteries were instructed. The instruction lasted from the 15 VI to the 25 IX.

The Higher Officers' School. 36 officers, destined to become commanders of battalions, regiments, and brigades were instructed : the instruction lasted from the I VII to the 5 XI. 30 officers finished the course.

The Machine Gun School. 180 men, destined to become gunners, were instructed. The instruction lasted from July to October. The instruction ended before the term, on account of preparations for war. 140 men finished the course.

The Engineering and Communication School. About 70 junior officers were instructed. The instruction lasted from July to the beginning of October.

The Preparing of Scouts and Spies. About 60 men were instructed. The instruction ceased in September on account of the departure for Canton of Com. Curden who did the instructing.

The Military Students' School About 600 men were instructed. The instruction lasted from August to the beginning of October : our instructing in this school was only occasional.

Working in these schools from June to the beginning of October 1925, our instructors won the confidence of the 1st Kuominchun as experts in military matters. This is confirmed by orders of the day issued by Feng, and by the manner in which our instructors were treated by the officers they instructed. (These feelings the officers carried to all parts of the army.)

The work in the schools had little effect on raising the standard of the armies, mainly because the " instructed " officers were scattered.

(Pages 8 and 9)

. . . . . . however, there can be no doubt that without foreign help the Kuominchun could not develop, and this fact might have induced them to look for help of other governments or groups. In the war with Chang Tso-lin the 1st Kuominchun Army fought actively only against Li Ching-lin, defeated him and occupied for some time (25. . . . . . 1925-22.11-1926) (the province of Chihli and still holds Sha-he. (Shensi).

Though helping the Kuominchun armies and directing them against Chang Tso-lin, we have not succeeded so far in loosening his pressure on us.

Supporting the Kuominchun armies and furthering their growth we have in them a force that may keep Wu Pei-fu back from making war against Canton. I say " may keep back " because the influence of the Kuomintang on the Kuominchun army is manifestly not strong enough to prevent it from advantageous political combinations with Wu Pei-fu. The fact that we are supplying the 1st Kuominchun with arms makes our influence over this army greater than that of the Kuomintang.

The regime of the territory of the Kuominchun army is comparatively favorable to the growth of revolutionary mass-organizations.

The arms supplied by us to Feng, including transportation, cost us about 6 millions of roubles, and the upkeep of our group of instructors cost approximately about half a million roubles. As stated above, our material help to the 1st Kuominchun precedes the political penetration and stabilization of the Kuomintang in this army. Therefore we cannot be sure of the role the 1st Kuominchun will play in the liberatory movement in China. It is therefore also very difficult to decide how far the expenses made by us correspond to the results we have obtained, as these results must be estimated not by their present value, but by the prospects they offer for the future.

OUR PROSPECTS IN THE 1ST KUOMINCHUN ARMY.

1.—*As regards the Kuomintang.* The results that can be obtained in a legal way through the Commanders are quite uncertain. On one hand, we have the *assurances of Feng and of others* that they intend co-operating with the Kuomintang ; on the other—there is the most *reactionary regime* in the military students' school and political instructors of the Kuomintang are expelled from the army, though they propagated only anti-imperialistic ideas. I think that by means of a clever pressure on the Higher Command and of applying it with our armament we can count upon gradual concessions to the party, in order that the latter may establish its political and organizing influence over the Kuominchun Army.

2.—*As regards our work of instruction* . We may count upon being permitted to carry on teaching (military technical). But if these is no influence on the organization of the army, the schools might be opened without any system and the students not properly chosen, and no proper plan observed of distributing them, after their having finished their studies, in order to raise the standard of the military capacity of the army.

x Kuomintang.

As regards our possibilities of establishing our influence on the organization and the operations (of the army), the prospects are not clear. It is probable that if the personnel of the staff and the officers' school are well chosen and if a proper pressure is exerted on the High Command when supplying it with armament, it will be possible to get *some* influence in these matters. But it must be noted that if in future there is no influence on the organization (at least a partial one), we run the risk of being discredited as specialists of military matters, even though the teaching in the schools be excellent. As a matter of fact, if the teaching is not connected with some measures of organization, it will not give the expected results with respect to the raising to the military preparedness of the army. We may succeed in appointing our advisers to all (or at all events to some) of the commanders of divisions and brigades. This can lead to the establishing of our influence in the Army.

It would be, the least to say, *naive* to expect that by means of military teaching alone we could obtain political influence in the army.

In summary, the possibility of developing in the 1st Kuominchun Army the influence of the Kuomintang and of our military instruction work depends on the growth of the liberatory investment in China and the size of our material help to the 1st Kuomnichun Army.

(Signed) Seifulin

19 4 26. IV No. 030.

Document No. 17 speaks for itself. The Christian general amazingly signs a receipt for goods delivered. His friends explain away such a fact by asking where else was he to receive the goods? But impartial observers in China do not care whether he received it from Soviet Russia or Lappland. They want to know what was the interest of Soviet Russia in making these huge expenditures in China ? They want to find out not why Feng took the arms but why Soviet Russia gave the arms to Feng. Herewith Document No. 17 :

RECEIPT

The present receipt is given of the Government to the U.S.S.R. in token that, in accordance with the obligation entered into by me, I have received supplies to the amount of six million three hundred and ninety-five thousand six hundred and forty-two roubles, according to the list attached hereto.

(August 1926, Moscow)

ROUBLES, 6,395,642

I have received the supplies in accordance with the list which I certify hereby.

Signed : Feng Yu-hsiang,
15 August, 1926.
Translated by K. Kraff.
16 August, 1926.

A TRUE COPY :
Signed : V. Rogatcheff.

RECEIPT.

The present receipt is given to the Government of the U.S.S.R. in token that, in accordance with the obligation undertaken by me, I have received supplies to the amount of four million five hundred and one thousand nine hundred and ninety-nine roubles, according to the list attached thereto.

Roubles, 4,501,999.

August, 1926. Moscow.

I have received the supplies according to the list which I certify hereby,

Signed : Feng Yu-hsiang,
15 August, 1926.
Translated by K. Kraff,
16 August, 1926.

A TRUE COPY :
Signed : V. Rogatcheff.

Very Secret

LIST—And Value of the Property Delivered to the Kuominchun up to 1 June 1926.

Names of Articles	Quantity	Cost of a unit	Total value	% of discount	Total reduction	Total reduced value subject to payment
		Roubles	Roubles		Roubles	Roubles
Rifles	27,970	55.25	1,545,342.50	5	77,267.12	1,468,075.38
Cartridges	27,350,545	82.23	2,249,031.62	5	112,451.58	2,136,580.04
Machine guns (Maxim)	90	1,552.12	139,726.80	30	41,918.04	97,808.76
Machine guns (St. Etien)	50	1,880.75	94,037.50	30	48,211.25	65,826.25
Machine guns (Vickers)	3	1,260.00	3,600.00	30	1,080.00	2,520.00
Machine guns (Lewis)	4	1,086.75	4,347.00	30	1,304.10	3,042.90
Guns (3-in)	42	7,956.00	334,158.00	30	100,245.50	233,906.50
Limbers	42	751.40	31,586.80	30	0,467.64	22,091.16
Gun carriages	84	1,502.80	126,236.20	30	37,870.56	88,364.64
Artillery harness	126	859.15	108,252.90	30	32,475.87	75,777.03
Panoramic sights	63	442.00	27,846.00	30	8,353.80	19,492.20
Shrapnel (for field guns)	11,346	39.07	443,288.22	5	22,164.41	421,128.81
High explosive shells (for field guns)	11,346	52.08	590,899.68	5	29,544.98	561,354.70
Hand grenades	10,000	4.63	46,300.00	100	46,300.00	—
Chemical shells	640	38.56	24,678.40	5	1,233.92	23,444.48
Trench mortars	10	400.00	4,000.00	100	4,000.00	—
Shells for bombthrowers	1,000	15.00	15,000.00	100	15,000.00	—
Swords	1,000	12.75	12,750.00	30	3,825.00	8,925.00
Spears	500	9	4,500.00	100	4,500.00	—
Engineer materials	—	—	93,488.00	25	23,372.00	70,116.00
Aeroplanes	3	—	300,291.16	25	75,072.79	225,218.37
Total	—	—	6,199,325.78	—	675,658.56	5,959,276.70
	Cost of transport					436,365.61
		GRAND TOTAL				6,395,642.31

It Pays to Advertise

There's Still Money to be Made in China

SPECIAL attention is called to the article on the "Billion Dollar Sky-line of Shanghai," which we publish elsewhere in this issue. Large, modern buildings are being erected in this city, which will be occupied by thousands of offices and firms. There is confidence behind this investment, confidence in the city and in the municipality which manages the city ; confidence in the trade of the country, for which Shanghai is the banking and commercial center. Shanghai taps one of the richest agricultural and commercial areas of the world. The enormous city which has been built up on the mud-flats of Shanghai is the product of the wealth that pours into its coffers and warehouses from the Yangtze Valley, the economic and cultural heart of China.

Civil wars have disturbed and distressed Shanghai, but the trade of the place continues to prosper. In fact, as the hinterland becomes dangerous for the investment of capital, more and more is thrown into Shanghai enterprises. But China is not always going to be in civil wars, nor do these wars always upset economic processes. It is a curious fact that until 1925, the civil wars hardly affected Shanghai and its trade. It was after the Nanking Road Incident, when the Communists were given a slogan which they could use against the city, that its trade suffered at all from the distressful political conditions of China. But this is but a temporary condition and those who understand China and have foresight are continuing to build and to plan for the future—which is not as distant as the nervous trader would have the world imagine.

The *Far Eastern Review* has been fortunate in having as its advertising clients, firms of wisdom and vision who continue to keep their names before the purchasing public in China. In spite of the troubles, these advertisers continue to call the attention of Chinese engineers to their goods and it is highly gratifying to the *Far Eastern Review* that so many of the products of its advertisers are being used in the construction of Shanghai's massive structures, which are a permanent reminder to the Chinese of the solidity of the foreign effort in China, of the constructive phases of foreign life here. There is money to be made in China still, by Chinese and foreigners, and only the undaring is frightened by a few months of trouble. When the crops come in and money passes back into the interior, improvements will be made there, too. It should not be forgotten that at this moment, Nanking is improving its electric light plant which has been had for years and Canton is increasing its telephone equipment. These developments do not indicate that there is no engineering trade in China.

The Anti-Japanese Boycott Movement

THE anti-Japanese feeling which is being stirred up in Canton and Shanghai in protest against the sending of Japanese troops to Shantung, besides being unjust has the additional disadvantage to China of making it absolutely necessary for Japan to join with Great Britain in her own interests. Japan's friendship for China during the past year has saved China from the probable occupation of large parts of the country by foreign forces. It was Japan's unwillingness to join in such an occupation which, more than any other factor, made it impossible. In the first stage of the Nanking outrage it is not beyond the probabilities of the political situation that the United States and Great Britain might have acted together politically as they acted together in a warlike measure in laying down barrage about Nanking. In spite of the fact that at Nanking, the Japanese suffered as much, if not more, than the British and Americans, the Japanese nevertheless withstood the pressure brought upon their statesmen to intervene in China.

It was only when Japan was faced with the possible destruction of her vast economic interests in Shantung and North China that she sent a small party of troops to Tsingtao to protect interests for which Japan entered the Great War on the side of the Allies, and upon the development of which depends much of the economic life of the Japanese people. It may be argued that it is unfortunate for Japan that she must obtain her raw materials and food products from China. On the other hand there is the inevitable choice between Japan trading in China on the sheer basis of business or Japan entering upon a period of neo-imperialism, which is as objectionable to the Japanese as it is to the Chinese.

If those who control policies in the Kuomintang and in the Nationalist government conceive Chinese political problems not merely from the standpoint of an immediate and momentary accresion of power to a political party, but to the more statesmanlike view of the permanent development of the country and its accession to a position among the powers of the earth, then they must realize that without the friendship of Japan, China becomes politically the weakest of countries, for since the Washington Conference it has been Japan, and Japan alone, which has been protecting China in the international councils of the world.

Those who favor the anti-Japanese boycott movement argue from two premises: firstly, that Japan is so hit economically that the Japanese laborers and business men who have interests in China will force the Government to agree to any Japanese program which may be devised by the Chinese; and secondly, that public opinion in the United States is so pro-Chinese that if Japan attempted to utilize forces against China, the United States would intervene on China's behalf.

Such a basis for thought on this subject does not take into account the most serious factors in the problem. The Chinese seem to forget that Great Britain's annoyance with China has become considerably deepened by the fact that Great Britain believed after Hankow and Kiukiang and the Christmas Day Note, the British Government have more than met China half way and in spite of all of Britain's efforts to placate and satisfy the Chinese people, every concession only led to a further demand until the British felt that they were being made a cat's-paw in a vast and sinister international game, and they determined that not another concession would be made and not a further step toward conciliation would be taken until the Chinese people ceased what the British regard as an indecent and subversive campaign against them.

The Japanese are likely to view the present boycott situation in exactly the same way. They are likely to assume that they have done everything that is possible to show the Chinese that theirs was a program of friendship and co-operation, that they have, in fact, sacrificed political advantages in a continued support of China's diplomacy in the world, and that instead of the Chinese appreciating what Japan has done, the Chinese seized the first opportunity that affords itself to attack and attempt to destroy the Japanese position in Shantung. There comes a point when nations grow weary of making every sacrifice for trade interests and when they view this question from the standpoint of morals and honor. It is not to China's interest that Japan should ever view the China problem from a standpoint which does not include a view of practical interest, for if that occurs there will be Japanese armies marching across the plains of Pechihli and occupying whatever part of North China they desire to occupy, and there will be no time then for talk of conciliation or of friendship. It will be a question then entirely of the use of forces to protect previously guaranteed rights.

It is unbelievable that the thinking men of the Kuomintang favor this current anti-Japanese movement which is little more than a diversion in another direction of that buoyancy of youth which has been released among the masses of China by the revolutionary activity of the Kuomintang party. But the party must remember that its power to check and control such forces was made evident in the complete suppression of Communist activity after the establishment of the Nanking Government, and that if the party possessed such power at that time, it possesses similar power to-day. If the party was in a position to control the masses so that there were no strikes and no demonstrations during the month of May, the party can to-day control the masses that there should be no breach of the friendly relations between China and Japan, and if the party fails to utilize its vast power in this respect, it will have to assume responsibility for whatever disasters may befall China because of it.

Dr. Hu Shih's Motor Car Civilization

By George E. Sokolsky

HU Shih is usually referred to as the Father of China's Literary Revolution. It is always a question whether his work in making the spoken language of China a literary medium and bringing the literature to an increasingly large number of Chinese, did not actually accomplish more for China than all the principles and slogans laboriously worked out of the tiny brains of secondary politicians. His revolution teams with life, while the politicians have brought to their land only destructive processes. His suggestions are the sparkle of hope in an otherwise black age.

But now Hu Shih finds that too many thinkers in China deal only with words: with literature and poetry and philosophy, with the relationship of western to eastern thought. But thought without action is as nothing at all. He visited the United States and Europe and Japan and saw a vast materialistic civilization bringing to the people a spiritual awakening. Not the rare Mozart and the rarer Leonardo da Vinci, but the masses, the plain people, the Babbitts think and read and know and have comforts and society which kings and philosophers and the choice of the earth could not have imagined a century ago. He finds a Lindbergh hopping off to Paris in a mere 32 hours while a Chinese has to wander 104 days to get from Kansu to Peking; he sees Chamberlain breaking Lindbergh's record in a few days, while China is still trundling in rickshas. He watches American bricklayers float to their day's labors in Mr. Ford's motor car civilization, while China's professors still are carried on the backs of sweating human beasts, the ricksha coolie, the sedan chair coolie whose eyes face the pavement and whose neck is turned downward until his brain ceases to be human and becomes that of the animal with whom he competes for a livelihood. The spirituality of the East! There is no spirituality where millions slave and even the rich spend most of their days attending to the mere business of living.

Dr. Hu Shih

The Philosophy of Engineering

And so, Dr. Hu has returned to his country with the philosophy of engineering. Make men drive motor cars and they'll stop dreaming so much about what Confucius said to his disciples and why. They'll work out accountancy problems and put an end to the political chaos in China; they'll spend less time eating over-rich foods to prove that they have the price, because Rockefeller does not have to be fat to show that he is rich. It does not matter in a civilization where men are judged by their production rather than the size of their gowns. Keep men at work building huge industries and they'll have no time to torture concubines and keep their sons and daughters-in-law in spiritual bondage. The Materialistic Age in the West has brought human beings too much personal freedom—but in the so-called spiritual civilization of Asia there is only slavery, narrowness, wastefulness, dissipation of human energy and chaos.

So speaks a sage of China! The small newspapers of the land ridicule the idea as coming from one who would be a Confucius, but after all why be a Confucius when to be a Hu Shih is even greater. For his is the solution which will make modern China great. He wants the Chinese to work modernly, to use cranes and derricks and to build railways and ships. He wants them to use steam and electricity and to manufacture the goods they consume. He wants them to become so free that they will understand what to do in an eight-hour working day. He wants the Chinese peasant to become a farmer with tractors and chemical fertilizer, with good health and fine products, with bustling railroads and steamships to bring their products to the great centers, with grain elevators and banks to protect them against hawk-nosed middle-men. Dreams, you say! Why more so in China than in Kansas or Nebraska? While more so in China than in the desert which is now the garden-like Imperial Valley of California?

But such a civilization requires training and education and statistics and hard work. For years, China has been sending students to the United States to become specialists. They have returned to China with nothing to do. Cornell has produced agricultural engineers; Colorado, mining engineers; Pennsylvania, railway engineers and so on; great American universities turning out skilled and brilliant Chinese specialists. What are they doing in this country? Sitting about the large cities looking for political jobs; holding down small translators jobs in banks and mercantile houses, complaining against the fate which does not give them a chance; turning sour against the foreigner who enslaves their country. That is not work. That is doing nothing for China. That is a waste of talents and learning. Put them to work doing things. Build roads and force every tuchun to drive his own Dodge and every colonel to know how to fix a carburetor. Turn a mechanically-minded nation into modern mechanics. Make the engineers do engineering work. There is so much to do in China and the politicians are only philosophers and philosophers do nothing but talk. This, from the man, whose History of Chinese Philosophy is a best seller in his own country.

Television and Radiovision

By H. O. Kung, E. E. Graduate School, Purdue University

COMMUNICATION in the modern civilized world has been developed to such an extent that the President of the United States of America can talk with the King of Gt. Britain just as clearly as we talk by telephone in the same town. A concert in a studio can be heard by thousands and thousands of people, no matter how far distant they are from the broadcasting station, provided the station is a very powerful one. Pictures of the ceremony of the inauguration of President Coolidge were dispatched, shortly after they were taken, through the phototelegraphic system of the American Telephone and Telegraph Company, to several principal large cities, and millions of newspaper readers were able to see those pictures the next day. Fifty years ago no one could imagine what we are enjoying of the modern electrical communication system nowadays. But, on the other hand, on the assumption that the world is progressive, we may assume what it will be fifty years hence.

What will the electrical communication system be in fifty years from now? The following may well be supposed to be the case, if it is not too optimistic. A world-wide statesman stands by a microphone at a broadcasting station, delivers his international speech over a combination of relay and rebroadcasting system, the people in all parts of the world, no matter how far they are apart from the statesman, may hear his speech and watch his gestures just as well as we are hearing and seeing the phonographic talking motion pictures recently developed by the A. T. &. T. Co. The telephone in your house would be larger by merely a small box hanging up on the wall, and there would be a screen, about the size of your dressing room glass, on which the party with whom you are talking would appear. The smiling face and gentle gestures would be exactly reproduced on the screen, as if you were talking face to face. All these have to be developed under the arts of television and radiovision.

The idea of television is almost fifty years old. In 1875, Mr. Carey of England thought of the possibility in using some kind of photo-electric cells to perform a very simple television. His article appeared in a later year in *DESIGN AND WORK*, a scientific magazine which has been discontinued long ago. A brief explanation is given below.

The screen may be divided into a number of small squares. Behind each square a selenium cell may be located at the sending end and an electric lamp at the receiving end. One side of the circuit may be connected according to their corresponding positions on both screens and the other side connected to a common battery. A shadow may be projected on the screen at the sending end. Selenium cells behind the screen under different degree of illumination would permitted a certain amount of current to pass through in each individual circuit, which in turn would light the lamps behind the screen at the receiving end and thus reproduced the similar shadow. In order to get a more comprehensive view of natural scenes the number of squares of the screen must be increased to a great extent ; consequently, the number of wired connecting them must be increased to the same degree. The tremendous cost of the installation of this system would prohibit it in practice. It may, however, be remenbered that when the telegraph was first invented, more than twenty-four pairs of wires were used in order to convey the twenty-four letters of the alphabet and necessary signs for punctuation.

According to the data available, the idea of television is not only an old one but it has been suggested or improved by a number of scientists of several countries. A few lines of quotation from my book, Phototelegraphy, Television and Radiovision, would make this self-explanitory :

> " A chronological list of the progress of television.
>
> 1875, Mr. Carey, an Englishman, conceived the idea of television.
> 1877, Professor Kerr adapted a mosaic of very small electric magnets for television.
> 1879, Dr. Carlo Mario Pesosino, an Italian, made another suggestion of television.
> 1879, Several articles appeared in La Nature, Scientific America, and Phil. Mag., etc.
> 1880, Du Moncel, of France, made some improvement.
> 1881, Professors Ayrton and Perry used magnetic needles for light control.
> 1891, A French physicist suggested the adoption of two discs mounted with a number of lens in each."

There are forty more names are on the list yet. The last mentioned one, a two discs system, led to Mr. Jenkin's invention and also Mr. Baird's, of Scotland. Now, let us review the more recent developments.

About seventeen years ago Professor A. A. Campbell Swinton of England suggested the cathode ray television system, later he suggested that it might be used in a wireless system as well as with telephone wires. As the name implies, cathode rays may be used as light sources at both transmitting and receiving ends. Two magnets may be placed in such a position that they are both perpendicular to the beam of the cathode ray and at 90 degrees from each other. These magnets may be energized from two separate sources of alternating current of different frequency, say one of 10 and the other of 1,000 cycles per second, so that the cathode ray may flash over the whole screen in a manner like the weaving cloth. The screen may consist of a great number of small cubes in which photo-electric cells are installed. A scene may be projected through the lens upon the screen on one side and the cathode ray weaving on the other side. By the illumination of cathode ray on the screen, and therefore on the cells weak and strong currents may thus be sent out through a local circuit and transmitting means to the receiving station and reproduced under similar arrangment. This idea is, of course, a very good one, but it requires a great sum of money and length of time to put it into practical operation.

Up to very recent years, Mr. C. F. Jenkins, of Washington, has been endeavoring to invent a radiovision system by utilising prismatic disks. He has suceeded to the extent that a white and black dancing girl film was actually reproduced from a motion picture, carried by radio waves, on a small screen at the receiving end. The principles are the same as his radio photograph machine ; the only difference is that radiovision reproduces pictures continuously, while the radio photograph machine reproduces one picture at one time.

In the August of the last year, the British Post Office issued a license to Mr. John L. Baird for broadcasting of sound and pictures at the same time through the Baird system in the City of London. For years and years Mr. Baird has been improving his television system. But whether this system can be fully commercialized still remains to be seen. In the Baird system tiny lenses are fastened in a disc but arranged in a spiral path so that on a complete revelution of the disc the whole picture will be all covered and transmitted. It is, however, not completely, satisfactory yet, and is still in the experimantal stage.

One of the very recent developments of television is by Dr. E. F. W. Alexanderson, who has become famous since his invention of the high frequency alternator for wireless communication systems of the General Electric Company. Twenty-four mirrors are fastened on the rim of a large drum. All these mirrors are set at different angles from each other with respect to the axis of the drum in order to reflect a seven-light-ray to flash over the whole screen. The interesting features of Dr. Alexanderson's system are the seven-light-ray, which appears like a cross section of a seven-wire strand cable, and twenty-four mirrors on the drum instead of lenses on a disc. It is expected that Dr. Alexanderson may be sucessful with some further improvements.

Another research engineer of the General Electric Co., Mr. C. A. Hoxie, developed recently a system which will perform a talking motion picture in using a single film of which one-eighth of an inch is the sound record and seven-eighth of an inch the picture record. In the writer's opinion, Mr. Hoxie's system may lead to another way of solving the problem of television and radiovision.

Dr. F. Gray, who graduated from Purdue University in 1911, has just demonstrated his invention on television between New York and Washington, D.C. By this invention, Mr. W. S. Gifford, the President of the American Telephone and Telegraph Company, at New York City, could see the face of Secretary Hoover at Washington, D.C., when both took the telephone receiver from the hook and talked to each other. This demonstration was carried out on April &th, 1927. The principle of Dr. Gray's system is similar to that of the phototelegraphic system developed in the same laboratories, the only difference being that the former apparatus reproduces pictures consecutively, while the latter reproduces one picture at one time. Although Dr. Gray's invention can only enable one party to see the other and not *vice versa* at the present time, it will not be difficult to make both parties see and hear each other simultaneously.

Correspondence

WOOSUNG, CHINA.
June 14, 1917.

The Editor,

FAR EASTERN REVIEW.

SIR,—I was sorry to find some mistakes in the reprint of my article, the most unpleasant of which is on page 220. Instead of :—

$$\sum(\mathrm{H}) = 116.5\,\mathrm{t}$$

and

$$\frac{\sum(+\mathrm{H})}{\sum(-\mathrm{H})} = \frac{139.0}{116.5} = 1.20\text{ ; Allowance } = 0.20\text{ or }1.20\ \%$$

the formulae should be :—

$$\sum(-\mathrm{H}) = 116.5\,\mathrm{t}$$

and

$$\frac{\sum(+\mathrm{H})}{\sum(-\mathrm{H})} = \frac{139.0}{116.5} = 1.20\text{ ; Allowance } = 0.20\text{ or }20\ \%$$

As it is difficult to understand the result of the calculaton I should thank you for an emendaton in the next issue of your REVIEW.

Yours truly,

DR. BERRER.

Japan's Food Problem

Menaced by the Chaos in China

Editorial Forward : It takes four Chinese farmers in China to raise an acre of rice while one Chinese in California can raise 3,000 bushels. The Chinese farm laborer earns from ten to fifteen cents a day while his fellow-countryman laboring in the rice fields of California is paid three to ten dollars a day and "found". Two-thirds of the California grown rice is exported, of which, some 70 per cent. goes to Japan. In the early days of rice cultivation in California, the native farmer, true to the traditional outlook of his state on Asiatic problems, raised a great hue and cry for a protective tariff against the disastrous competition of "cheap Oriental labor" and won his point. Last year, a committee from a Chinese Agricultural Association visited San Francisco to protest vigorously against Americans flooding China with cheap rice and ruining their agriculture. The Japanese Government also sent a commission of experts to California to see how it was done.

The Japanese after learning all there was to know about American methods of cultivation on unirrigated lands went away profoundly impressed. They realized that the cost of this up-to-date equipment was far beyond the purchasing power of the average Japanese farmer and the tiny land holdings in their Country absolutely precluded the introduction of these methods. In fact, there is only one place in the Far East where rice cultivation along modern lines can be applied with succees. This territory lies in Manchuria along the Mongolia border and here Baron Okura and the South Manchuria Railway Company are already opening up the lands for dry rice farming.

From being a rice exporting country, Japan is now finding it increasingly difficult to produce the staple food for her rapidly mounting millions. This year Japan will have to import approximately 12,000,000 koku (3,840,000 pounds) of rice to make up the shortage in the domestic crop. Although a large part of this will come from Burma and Indo-China, a very considerable portion will be made up from imports from the United States.

Japan's own rice production is made possible only by the most intense methods of cultivation and fertilization. Practically all the bean cake exported from Manchuria finds its way into Japan, where it is used as fertilizer in the rice fields. Deprive the Japanese farmer of this cheap fertilizer and Japan starves. The only hope for Japan to control her own food supply in nearby territories is to develop the river bottoms in Manchuria and Mongolia, but the continued unrest in those regions, together with the jealousies of the Russians, has made it difficult for her capitalists to make headway against the obstructions placed in their way by the local Chinese authorities. Baron Okura and his group have leased immense land holdings in these regions for the purpose of bringing them under rice cultivation, in order to assure to Japan another accessible source of food supply. In these vast Manchurian and Mongolian plains the same system can be applied to rice cultivation as has proved so successful in California and if the Japanese had any guarantee that their investments would be protected against Chinese official rapacity they would soon "make the desert blossom like a rose" and develop a new source of food supply that would outrival in importance and profit their former phenomenal success with the soya bean in the same regions. To the many natural obstacles placed in their way of developing a new source of food supply in Manchuria, there is always the possibility that the Chinese Government may at any time prohibit the export of cereals. This has been done several times in the past and with the constantly diminishing production of rice and a corresponding increase of importations, the Chinese authorities may again resort to this expedient in order to keep the domestic product from leaving the country. Because of poor crops, ravages of war and other causes arising out of the present chaotic situation, the rice crop of China is falling off at an alarming rate. The statictics for the first nine months of 1926 show that China imported 13,143,486 piculs of rice during that period or more than twice the amount for the corresponding period of the previous year. Hankow increased its imports from 221,233 to 1,811,925 piculs, approximately 200 per cent., while Dairen more than doubled its takings. The same remarkable increase is seen in the importations of wheat and flour which can also be produced in unlimited quantities in the "Granary of The Far East," if law and order under a stable government prevailed in Manchuria and Mongolia.

The rice growers of California are benefitting from the disturbed conditions in the Far East, but the time must come when Japan will be compelled to take some drastic step in order to develop a nearby source of food supply. No self-respecting nation will willingly permit itself to become dependent upon an uncertain source of food supply from across thousands of miles of ocean, when it can raise sufficient for its own needs in more accessible and defensible territories. Fortunately, the specter of a war between Japan and America no longer looms as a menace to friendly relations and American grown rice may find an increasing market in Japan. Japan and America may never go to war, yet it would be foolish for Japan to close her eyes to the fact that forces are constantly at work to bring about such a calamity. Japan, therefore, cannot afford to become dependent upon America for her staple article of food when it can be cultivated on lands located within her own economic sphere of influence. Neither can she be expected indefinitely to remain quiescent under conditions which are driving her slowly to brink of disaster while forcing her to seek her food supply from lands across the Pacific.

The peaceful efforts of Japan to develop Manchuria and Mongolia into a new rice producing center are being frustrated by the lawlessness and absence of guarantees, compelling her to turn more and more to foreign markets to supply the deficiency in the home demand. The conditions which make it possible for the California grown product to find a market in Japan is due largely to the suspension of the Japanese import duty of one yen (49 cents) per 100 kin (132 pounds) commencing February 15 and terminating October 31, of this year. On the Japanese market it is customary to mix or blend rice with a view to improving the flavor and appearance and owing to its similarity in taste and appearance, the California product is mixed with domestic rice up to as high as 40 per cent.

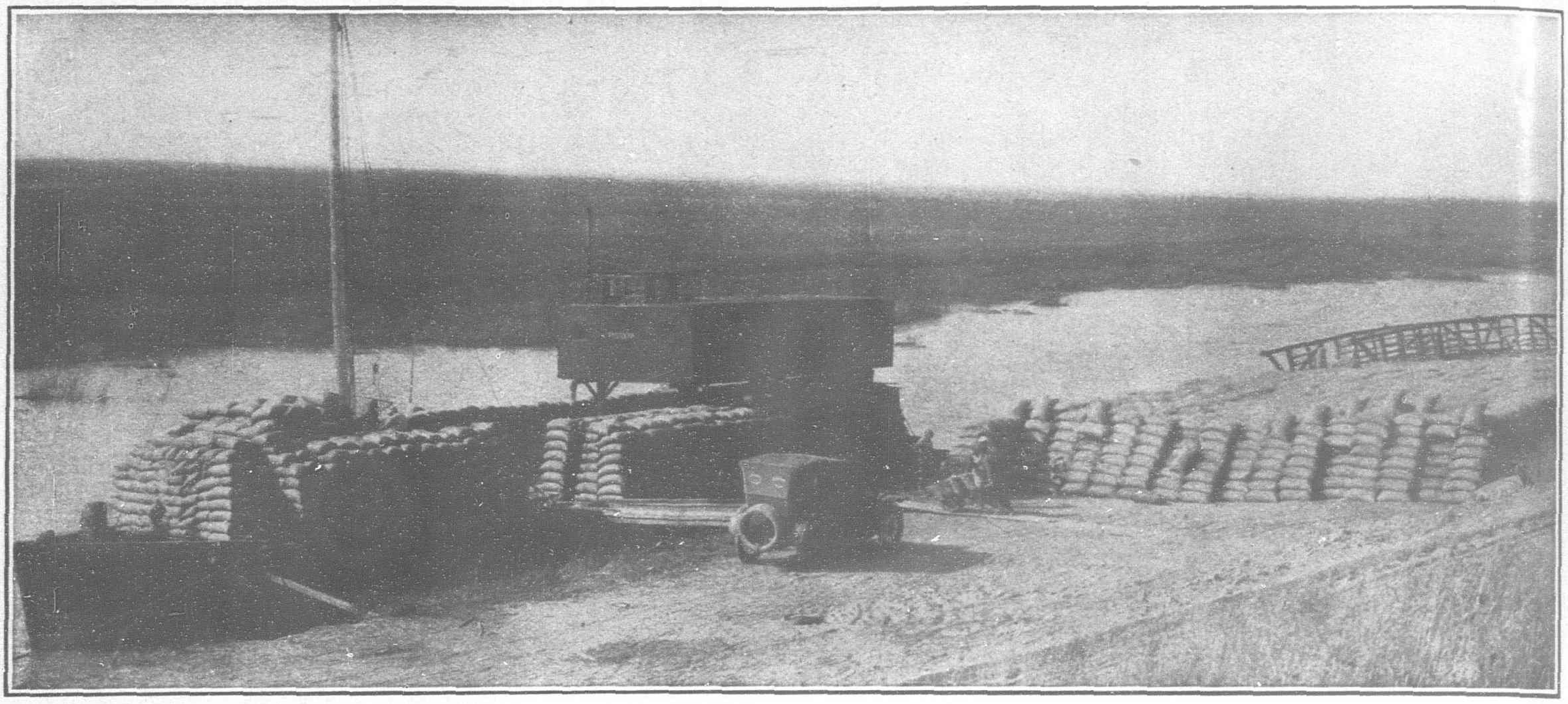
With the increasing population in that country and no means of extending the acreage to rice planting or increasing the yield, the food problem of Japan becomes each year more pressing. Whether it will be solved by increasing importations from the United States or the development of near-by sources of supply in Manchuria depends largely on the outcome of the present upheaval in China. The following article on the cultivation of rice in California is of timely interest to the peoples of the Far East.

Sweat or Gasoline?—Coolie or "Caterpillar"?

Who Will Win the Race for Control of the Rice Industry? The Amazing Story of How $5 a Day American Labor is Producing Rice at Less Cost Than the 30-cent Japanese Farm Worker—Raising the Rice on a Former Burning Desert—and Selling It at a Profit in the Orient

DOWN the blazing pathway of the setting sun, slipping eel-like through the portals of the Golden Gate, a long, sleek liner with the red sun of Nippon flapping at her stern, came to rest in the teeming waters of San Francisco Bay. Crowded at the rail were faces of Oriental stamp, unmistakable in the day's last light, as inspection over, the big Japanese vessel nosed to her berth at the dock. The fussy, bustling tugs drew off as lines were cast and rattling winches proclaimed the end of the voyage. Passengers descended-white, brown and yellow. Among them, one group was distinguished by the deference received from their fellow-countrymen. Evidently these were personages of some note!

Suave of manner, meticulously clad in perfect Occidental style, they entered an American limousine of costly make and were driven rapidly uptown. Morning newspapers published their photographs and announced them as a Commission of eminent Japanese statesmen, engineers and economists who had come to study American agricultural methods. In reality they were here with one big purpose in view—seeking the answer to a question which, to their Government, must have presented alarming aspects.



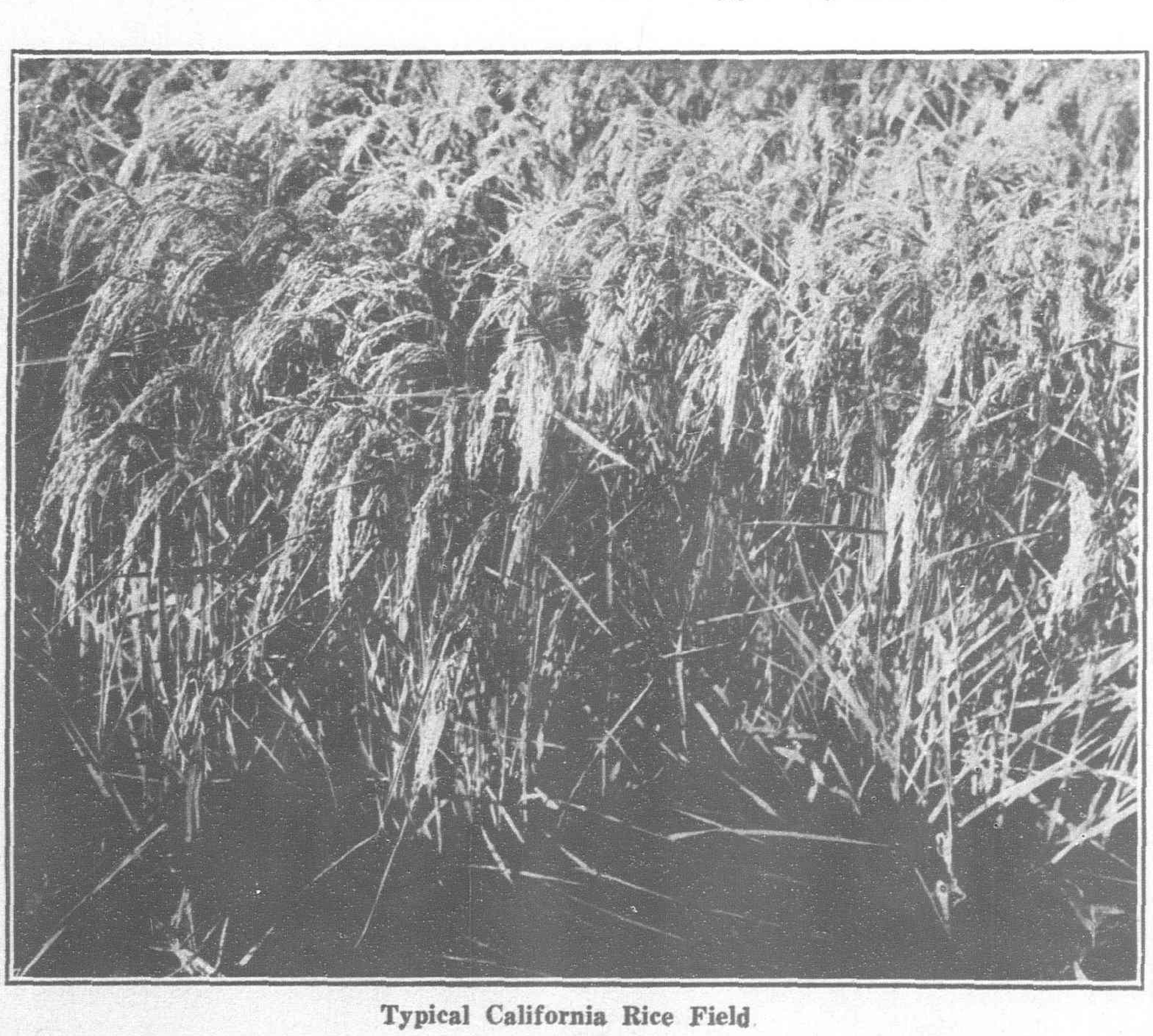
Rice on the Sacramento River Docks Ready for Shipment to Japan

"Is American Competition Threatening the Japanese Rice Industry?"

Now (they wished to know) can the United States—where farm laborers and mechanics work eight hours daily at $3 to $10 a day and board—produce rice of superior quality which can be shipped to the Orient and sold *at a comfortable profit?* How can this be done under the very noses of Japanese growers whose laborers toil from dawn to dark at from seven *to thirty-five cents a day* and board themselves?

Here then was the puzzle, the solution to which these eminent visitors sought. And so, with little loss of time, they were whirled away by their Americanized countrymen, to the broad rice fields of the Sacramento River Valley. The visitors found that this year, according to official estimates, California will produce more than 150,000 acres of rice—approximately 126,000,000 pounds—with an estimated minimum value of $5,000,000! They learned also that: (1) this California production represents only about 20 per cent. of the total rice production of the United States; (2) the United States exports annually more than 400,000,000 pounds of rice to foreign countries and her own Island possessions; (3) *at least one-eighth of this American-grown rice is sold in Japan!*

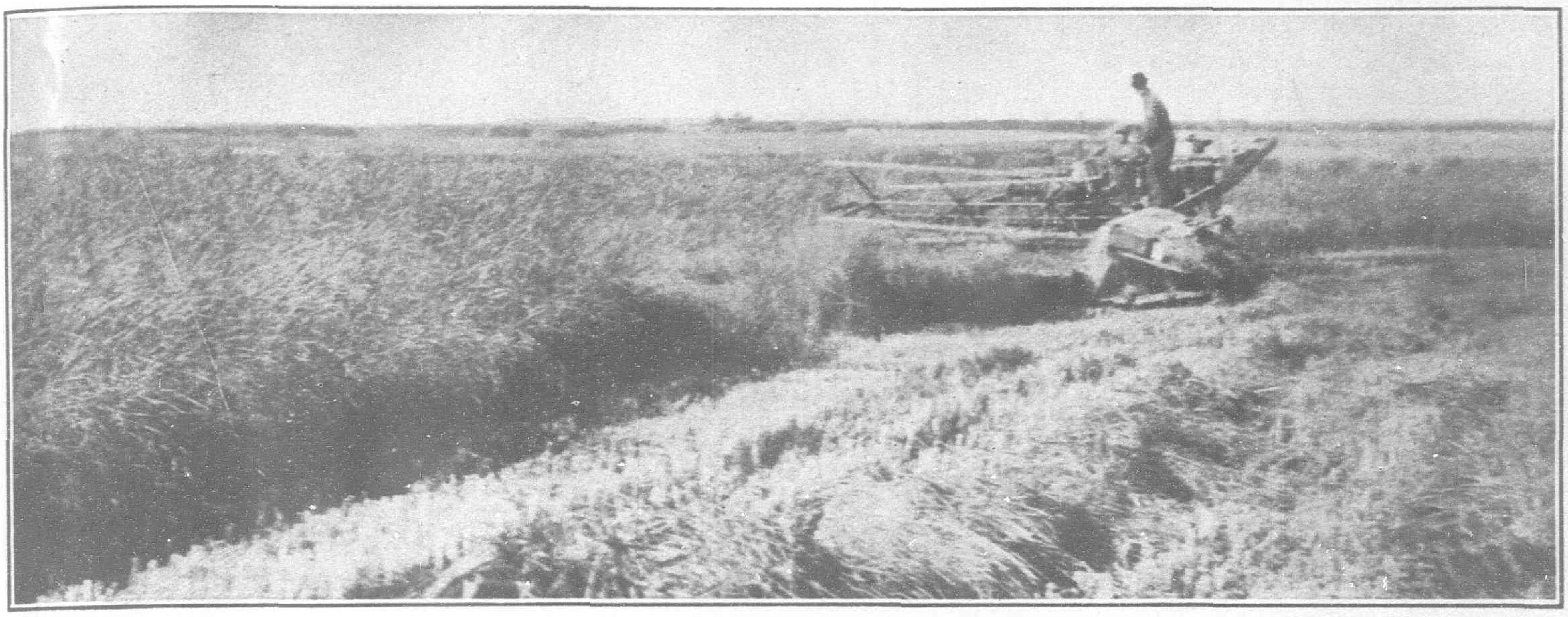
California, the Japanese investigators discovered, exports at a profit, nearly 70 per cent. of the state rice crop—and Japan is California's best rice customer! This has come about both through an International turn of affairs and through the rapid increase in the Japanese population. For the former, Japanese are barred from owning or leasing land in California and at present are practically denied admission to the United States as well as many foreign countries. They are also barred from owning land in China outside the treaty ports. For the latter, the Japanese population in its own land increases at the approximate rate of 750,000 annually, crowding the already over-populated islands of the Mikado almost to the bursting point. These two facts combine to create an interesting change in the rice industry of Japan.



Typical California Rice Field

A few years ago an exporter of rice, Japan now finds it necessary to seek supplies from abroad. Therefore, because of the high quality of California rice and its popularity among Japanese consumers, there is apparently no intention at present to discriminate against the California product. But what of the future? Where may this unexpected competition from America lead? Twenty years ago rice was unknown as a commercial crop in California. What will be the situation 20 years hence? And—most important of all—what is the secret of the California producers' success?

The eminent visitors found a simple answer to their questions in the roar of eager tractors, the humming of great harvesters and the whir of giant threshing machines. Here then was the solution—Machinery of American design and manufacture had so reduced the cost of production, and so improved



Binder and Tractor Harvesting Rice in California

the quality of the cereal, that American grown rice could be sold on the other side of the Pacific *at a good profit!* No less an authority than Prof. W. W. Mackie, in charge of cereal investigations for the University of California, advanced this logical explanation.

This disclosure seemed all the more startling to the Japanese visitors because to them the methods of our growers appeared extravagant and wasteful. Oriental farmers transplant and weed their crop by hand and the California fields seemed by comparison, ragged and ill-kept. The investigators must have been amazed by many of their discoveries!

They found in the California rice industry a typical American agricultural romance. It was not until 1908 that experiments conducted by Prof. Mackie (then with the United States Department of Agriculture) at the Biggs Experiment Station in Butte County, California, resulted in the conviction that rice could be grown successfully on land which had been abandoned as "worthless."

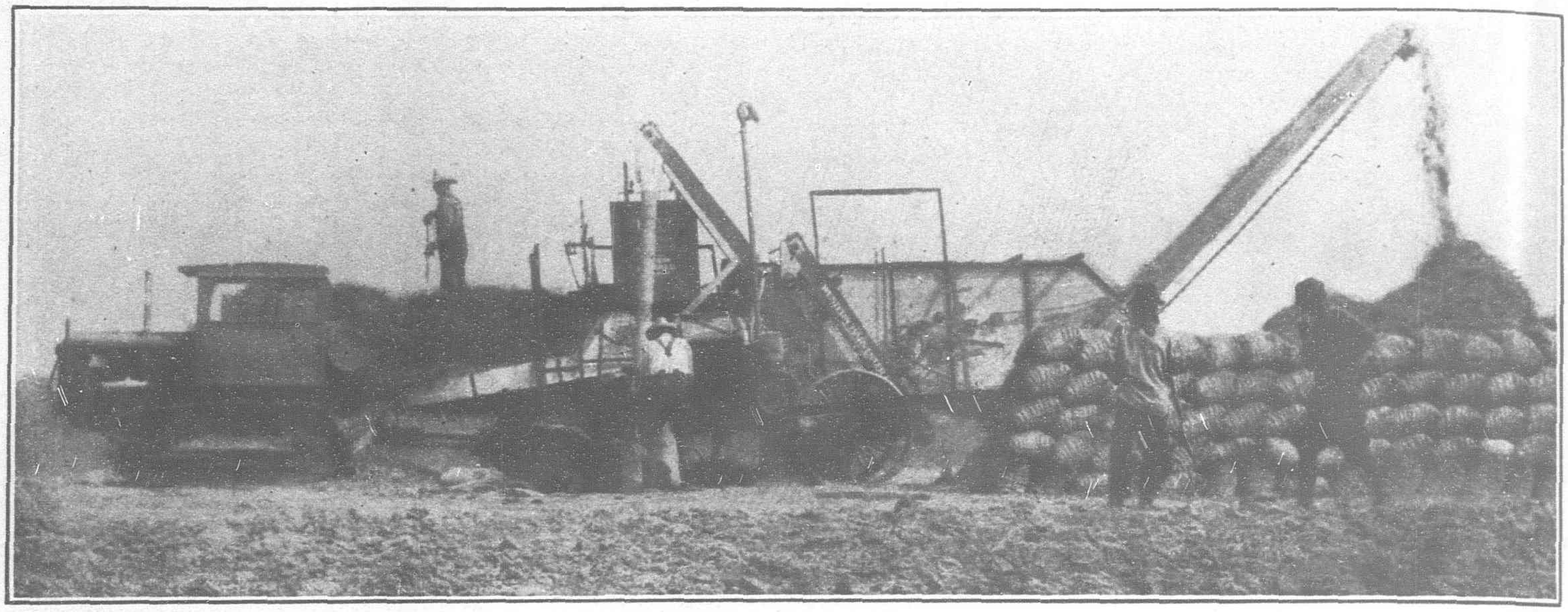
Thousands of acres of this undesirable land (surrounded by tens of thousands of acres of the rich, productive soil for which California's Great Valley is famous) had sold for as little as $5 an acre. This unused area, though small in comparison with the State's total tillable area, represented a vast acreage. And, until the advent of rice, it had presented a serious problem. Now much of this same land, devoted to rice culture, *rents* at an annual rate equal to five times its original total *selling* price!

The history of rice growing on our Pacific Coast encompasses but a few years. On Prof. Mackie's desk at the University of California, stands a bottle containing a sample of the first commercial crop of rice produced in the State—less than 20 years ago!

The Professor has seen his little experimental beds spread over thousands of acres. The rice crop has furnished the incentive and funds for vast irrigation projects, and now provides employment for hundreds of men at prevailing American wages.

Prof. Mackie gives credit to the Rice Growers' Association of California (a co-operative marketing organization) for the rapid development of the industry and the discovery of profitable foreign markets. Ralph P. Merritt, former Assistant to Herbert Hoover in the Food Administration and now head of the Sun Maid Raisin Growers, was the leader who carried the rice growers safely through the throes of early organization.

Binder and "Caterpillar" Harvesting Rice in California



Threshing Rice in California

The California rice farmers have attended the great American school of Experience. In typically independent fashion, they have pioneered their own cultural methods.

To begin with, they employed the great power and sure traction of track-laying tractors—using giant implements especially designed for the purpose, to break up and level the stubborn, hard, abandoned soil on which the future rice industry should flourish.

With the power of sixty horses at his command, and enormous implements controlled from the tractor seat by compressed air, one man accomplishes in a day what would require a month of Herculean toil by a small army of coolies, using their own crude implements. Special machines have even been devised for making the levees which control the irrigating water.

Instead of transplanting the rice by hand, the California growers seed the fields with machinery—and operate such large acreages that they would scorn to do the weeding which the Japanese producer deems so essential and performs by hand upon his diminutive tract.

At harvest time, a weird contrivance consisting of a harvester mounted on the front of a big "Caterpillar," is employed to cut the headlands or first swath around the field. In this way the crushing and waste of the regular harvester when used on the first cut, can be avoided.

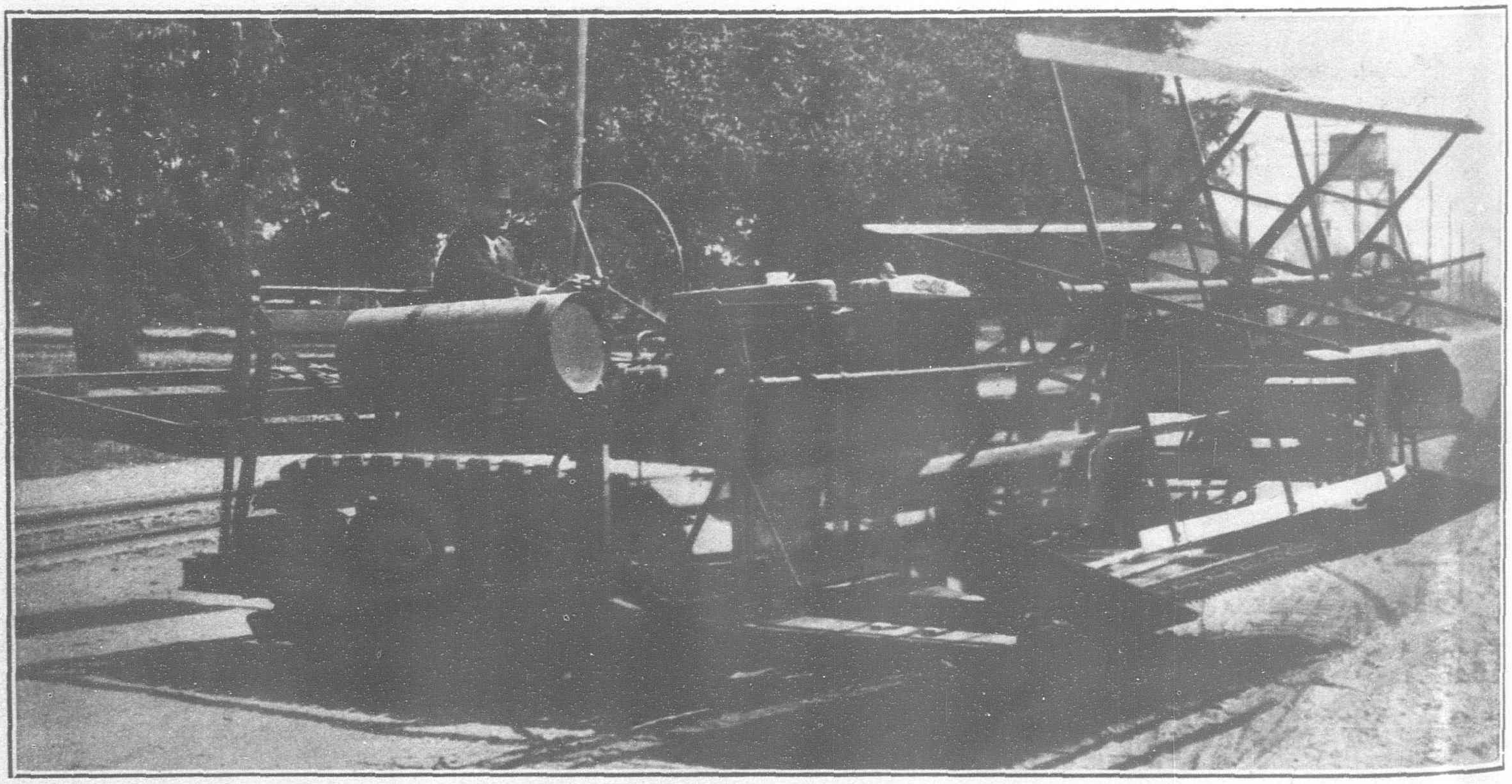
The entire rice harvest in California is performed with machinery. Binders—similar to those used in the wheat fields—are followed by tractor—operated threshing machines.

In case of wet weather during the harvest season, the tractors are equipped with extension tracks and the harvesters mounted on runners! Thus fortified, the rice-farmer can negotiate fields so muddy that horses and wheels would soon be mired.

And finally, another big tractor is hitched to a "train" of wagons and ten tons or more of the sacked rice is hauled to warehouse or shipping point *by one man*.

In wonderment, the Oriental visitors learned all these facts. The only sad part of the situation (from their viewpoint) is that, having discovered the secrets of the American system, they were yet at a loss to know just how these methods could be applied to their own problems!

They were confronted by the fact that few Japanese growers can afford the (to them) expensive American machinery. And in



Rice Harvesting Machine

the second place, it would be almost impossible to use this machinery on the tiny plots farmed by Japanese producers. It is to be feared the Mikado's Commission received little comfort or encouragement. But their keen eyes missed no detail; and their ears no facts which were voiced in their presence!

Meanwhile, without worrying much over the Japanese situation, California growers continue to improve their methods and to reduce their cost of production. An occasional year of low prices does not cause serious worry. The producers realize that rice, like wheat, is a world commodity, the price of which is controlled by world supply and demand. On the whole, the crop has proved (thanks to the Japanese market) very profitable.

Authorities are of the opinion that rice growing has come to stay as one of California's important industries. Just how much the acreage will be extended is a matter of conjecture. But Prof. Mackie recently revealed experiments which have been conducted since 1922 in the famed Imperial Valley, adjoining the Mexican border—experiments which indicate the Southern district may produce rice of higher yield and quality than the northern counties.

Here, perhaps, is the most amazing chapter of the story of California rice. For, within the memory of this generation, the Imperial Valley was a burning desert—given over to sand-storms, blazing sun, cacti and rattle-snakes.

The introduction of rice completes the marvel of reclamation and irrigation. For this is probably the first time in the history of the world that desert land has been planted on a large scale to rice—a crop which literally *grows in water* and which has always been associated with *swampy* areas, or at least with districts subject to heavy rainfall and excess water!

There is one other unusual—and slightly humorous—quirk to the story of the California rice industry! In its early days the growers raised a great hue and cry for a protective tariff and loud lamentations were heard anent the disastrous competition of " cheap Oriental labor." This and similar arguments won the point for the producers.

Now, however, Japan has no surplus rice for export; in fact, must *import* about six per cent. of her requirements, while two-thirds of the California crop is *exported*.

As for the Bugaboo of " cheap Oriental labor " and its attendant economic difficulties—that scarehead has indeed been dispelled by the scientific efficiency of American tillage tools, conceived in the mind of American genius and executed in the hum of American factories. The untiring, almost-human action of the binder, the seemingly-amphibious adaptability and tremendous power of the ' Caterpillar " tractor, the ceaseless wizardry of the threshing machine, have all become part and parcel of this broadening field of agricultural pursuit. These miracles of American skill have repeated once more the history of advanced Civilization in the triumph over decadent methods. American rice is giving Japan food—for consumption and for thought.

British Trade and Industry

By Gilbert C. Layton, Assistant Editor of "The Economist"

" SPECIAL TO THE FAR EASTERN REVIEW "

The Iron and Steel Industry-A World Review

THE World Economic Conference is in session and its proceedings are being followed with the closest interest in financial and business circles in this country. Though the Conference is not considered capable of miracles, the highest importance is attached to the meeting. The iron and steel masters in particular are interested in the attitude of the Conference towards the industry with which their fortunes are bound up. The Conference has the initial advantage of ample facts and figures on which to base its conclusions. It is of interest to note some of the salient points, for they naturally throw valuable light upon the chief problems which confront the iron and steel trades. For some years past the European, and especially the British iron and steel manufacturers have been suffering from acute depression. The reason may be summed up in a very few words: there is at present an appreciable excess of capacity over actual requirements. This is primarily due to the war. A number of countries, owing to the impossibility of obtaining metallurgical products from the majority of the belligerent Powers, were compelled to provide for their own needs on a considerably larger scale than hitherto. Moreover, the iron and steel industries in the belligerent countries themselves were called upon to make a great effort in the manufacture of munitions and implements of war.

But this is not the only way in whcih the war affected Europe's heavy industries. The peace settlement involved changes of the first magnitude. Germany and France felt these changes most keenly. Thus Germany ceded Lorraine to France, Upper Silesia was divided, Luxemburg was separated from the Zollverein and the Saar was incorporated in the French Customs area, with the result that Germany lost about 80 per cent. of her iron-ore production 30 per cent. of her coal production, 30 per cent. of her steel works and almost 30 per cent. of her rolling mills. As regards France, there was the gain of the blast furnaces and steel works of Alsace-Lorraine. Poland benefited by the division of Upper Silesia and a very considerable part of the Austro-Hungarian pre-war metallurgical production passed to Czechoslovakia.

The Depression in Europe

Very few figures are necessary to show the extent to which Europe has suffered since the war. In 1925 the world produced about 2 million tons less pig-iron and about 14 million tons more raw steel than in 1913—a year which witnessed exceptional prosperity. But the European production of pig-iron had dropped by 9 million tons and the production of steel by about 2 million tons. Put in another form, immediately before the war 58 per cent. of all pig-iron and about 56 per cent. of all raw steel in the world were produced in Europe, but by 1925 this proportion had fallen to 45. 7 per cent. The continents of the world, other than Europe, have made a remarkable advance. Thus the United Stated production of pig-iron had increased by 6 million tons and steel by 14 million tons. Again, other parts of the world have increased their output of both pig-iron and steel by about 2 million tons.

It is clear that the European steel masters were confronted by a serious situation. But they have not been inactive, for in the Autumn of 1926 they promoted the Steel Pact. Stated shortly, it is the object of that Agreement, to which the manufacturers of Germany, France, Belgium and Luxemburg, and subsequently those of Austria, Czechoslovakia and Hungary were signatories, to adapt actual production to immediate needs without the recurrence of crises through periodical over-production. Though it is too early to say whether the Pact has been successful or not, there can be no doubt that it has not worked so smoothly as had been expected. Incidentally, very little has been heard recently of the discussions regarding the attitude of British manufacturers towards the cartel. But the Pact does not deal with the fundamentals of the situation. The problem which in the end will demand attention is the relation between the post-war productive capacity of the industry and the world's demand for iron and steel products in the future. Many industrialists who have examined the position are by no means pessimistic. Given a return of the general economic position to normal, they hold that the increased productive capacity caused by the war will not be excessive.

The Position of Britain

A few more words may be added regarding Britain. There has been a conspicuous drop in our post-war exports as compared with pre-war exports. Thus the total exports of iron and steel products in 1913 were 5,049,000 metric tons, the figure for 1925 being 3,791,000 metric tons and for 1924 3,915,000 metric tons. The 1926 figure is not comparable owing to the industrial troubles which paralysed the trade for a large part of the year. As for the present position of the industry, record figures—at least so far as steel is concerned—are being returned and the whole industry seems well employed. Unfortunately, this is largely due to arrears of production following the industrial disturbance of last year. New orders are reported to be slow in coming forward, and it is not yet clear how much of the present activity can be maintained.

Are the Filipinos Ready for Independence?

By Honorable Carmi A. Thompson, Special Representative of the President

When Marco Polo returned to Europe after an absence of seventeen years spent in China, Japan, and the Philippine Island, he was thrown into jail for his supposed lies concerning these faraway countries which he described as Cipango, Cathay, and the Islands. For a century or more after his death he was regarded as Ananias' superior; but the travels of later explorers verified nearly every statement he made concerning these so-called mythical lands.

I have recently spent some time, at the direction of President Coolidge, in the Islands, named by the Spaniards "The Philippine Archipelago," in honor of Philip the Second of Spain.

I refer to the experience of Marco Polo to justify a request for leniency when I introduce my subject, with a little incident which occurred about the time my work was concluded in the Islands.

My party, including a number of newspaper correspondents, was at Baguio, a mountain resort north of Manila.

One morning a newspaper correspondent, my executive secretary, Mr. Jappe, and I visited the Benguet Gold Mine, near Baguio. Dressed in woollen clothes, quite a contrast to the customary whites we had worn for three months, we proceeded to the head of the trail leading to the gold mine. The panorama was the most beautiful I had ever seen. I could hardly believe my own eyes. I asked the correspondent what he saw. We were standing at the very edge of a dense pine forest. Looking down the trail he began to enumerate the interesting features on the landscape—said he: "I see a splendid grove of tree ferns, and just beyond a clump of coconut palms in full bearing, and yet a little farther to the left a native boy gathering bananas, and still farther the entrance to one of the richest gold mines in the world. I am glad I have no assignment to write this description for my paper. My managing editor would conclude that I had succumbed to the subtle influence of the Orient."

Nevertheless, this picture was before our eyes. The Benguet mine is 3,000 feet below the Baguio pines, and in that fall is the entire climatic condition from the temperate zone to the torrid zone. Unlike poor old Marco Polo, I can prove my story by proper and acceptable evidence.

The Climate, Geography, and Population of the Philippines

This story, to a certain extent, describes the climatic conditions in most of the Philippine Islands. The Islands are volcanic in character, and are usually mountainous in the center with great fertile, tropical, coastal plains lying between the seashore and mountains. The mountains furnish the conditions which produce an abundance of rainfall, the water supply for irrigation and for power, and the cooling land breezes tempering the tropical heat of the plains. Fertile, well-watered, twelve months of growing vegetation, its mountains laden with minerals and metals ready for the use of man if he will but take them. Is it any wonder that the Philippine Archipelago has been known for a century or more as the Pearls of the Orient?

You will recall that the Philippine Islands are about 300 miles, southeast of Asia; that from the northernmost island of the Philippines the southernmost island of Japan may be seen upon a clear day, and that the southernmost island of the Philippine Archipelago is practically contiguous to British Borneo. You will also recall that beginning with our Aleutian Islands there is a continuous chain of islands facing the entire continent of Asia and extending south of it. These Islands are under the control of America, Japan and Great Britain. Visualizing this chain of islands, you will readily see that they form an outpost for the continent of Asia; that the change in ownership or control of any of them might readily affect the commercial relations of the entire world with China and the Asiatic Continent generally.

The Philippine Archipelago is composed of 7,083 islands of which 2,441 are large enough to carry names. The total land area is 115,000 square miles. Notwithstanding the great number of islands, ninety-five per cent. of this territory is contained in the eleven largest islands.

In order that you may visualize clearly the land area of the Philippine Islands, I will tell you that the Island of Luzon, upon which Manila, the capital, is located, is about the size of Ohio, and the Island of Mindanao is about the size of Indiana; and as a group they will compare fairly well with the total landed area of the New England States plus the states of New York, New Jersey, Delaware, and Maryland. Another comparison is interesting—the entire Kingdom of Japan, outside of the little Island of Formosa, contains about 155,000 square miles of territory, of which a little more than one-third is tillable. In other words, the flowery kingdom has but 40,000 square miles of tillable land, whereas of the Philippine Islands, with their 115,000 square miles, more than half is available for the raising of ordinary tropical crops, and ninety-five per cent. of the entire area is available for agriculture or forestry. Of this vast area, but fifteen per cent. is now being utilized. The other eighty-five per cent. is public domain and is not contributing to the development and prosperity of the human race.

The population of the Philippines is about 12,000,000. Of this number about 11,000,000 are so-called Christian Filipinos, subscribing almost unanimously to the doctrines of the Catholic faith. Of the other 1,000,000, about 400,000 are Moros, who subscribe to the doctrines of Mohammed, and the remainder are so-called forest dwellers or hill people who are pagans.

No discussion of the Filipino people would be complete without a reference to the Moros, a very picturesque and interesting people. Unconquered by the Spaniards or by the Christian Filipinos, they surrendered to the United States Army because they thought they had an understanding that the American flag would govern and protect them from the Filipino rule forever.

About twenty years ago a musical comedy called "The Sultan of Sulu," had an unusual run in this country. Most people then and since have believed the Sultan to be a myth. I am here to tell he is not. I have seen him, indeed I spent one most enjoyable day in his company. He reminds you very much of the Ancient Moor as described by Washington Irving in his "Fall of Granada." He is interested in education and is a good business man. Of a swarthy complexion, he carries well his sixty-two years. By his treaty with the United States he gave up all temporal power, but in spiritual matters he is the Moro head of the Mohammedan church in the Sulu Archipelago, and it is not unusual to see the Moros falling to their knees for the opportunity of kissing his hand.

I am told that the Mohammedan religion does not permit a man to have more than four wives at a time, but this grand old Sultan has had, I am told, as many as fifteen wives at one time. I met his favorite wife at a dinner the Sultan gave for our party. I met his brother, who, because the Sultan has no direct heirs, is next in line for the throne. The future chieftain has taken to himself eight wives.

During my visit with the Sultan he took me to the new palace which he is now constructing and of which he is very proud. While thoroughly tropical in its architecture, it will stand out as one of the most beautiful homes is the Philippine Islands.

The town and province of Cotabato in Mindanao is another Moro stronghold. To reach Cotabato we sailed ten miles up Cotabato River. It is known as the Alligator River. Think of the most tropical river picture you have ever seen and you will have a picture approaching to some degree the tropical beauties of this stream.

When we approached the mouth of the river we were met by hundreds of fishing crafts known as " vintas," all decorated in Moro colors, streaming with palm leaves, tropical flowers, fruits and vines, manned by Moros in their picturesque costumes and led by scores of sonorous tom-toms beaten by their most beautiful girls. When we approached the dock we were met first by a datu or headman, his teeth blackened, for as you know they chew betel nut, garbed in a pair of tight-fitting black silk trousers, a very orange silk shirt, but bareheaded and barefoot. In place of buttons in the front of his shirt, there were five-dollar gold pieces. He wore a belt of twenty-dollar gold pieces, and there was a string of ten-dollar gold pieces from his hips down the side seam of his trousers to his feet. He wore five-dollar gold pieces as shoulder ornaments. It is a custom among the Moros to gather American gold money and use it for decoration; but this was the most bedecked Moro I have seen. He wore by his side a weird kris. A kris is a wicked sword used by the Moros. This was also decorated with American gold money. A member of our party counted more than one thousand dollars in gold coin upon this proud datu. Next to him came datu Piang, a patriarch more than eighty years old, considered to be the richest man among the Moros, although born a slave. He wore a highly colored turban, but was barefoot. Riches, however, with the Moro are land, wives and servants. Piang has had thirty-six wives and one hundred and fourteen children, and servants without number. I may stop here to say that later in the day old datu Piang took his kris from his side and handed it to me with its sheath and belt, saying that during his lifetime no one had ever been able to take it away from him; that he was old and he wanted to give it to me as a souvenir of my visit, and that he would never put on again the emblem of war.

Then came the Sultan of Cotabato. He appeared with two or three servants carrying queer shaped, very gorgeous parasols above his head: another one just behind extending the ever present betel-nut box, and one just in front of him carrying a cuspidor, and in the place of outriders there marched a few paces ahead of the Sultan two men with great swords of state. He, like datu Piang, wore no shoes. Everything had been wrought with great care and without regard to expense, except the cuspidor, but on account of constant change, I presume, it was fashioned from a Standard Oil can, which device was filled with moss and herbs, so that the artistic eye of the Sultan might not be abused, or his delicate olfactory nerve be offended.

With the exception of the intermingling of Spaniards, Chinese and other people who have settled among them, the Filipinos are a pure Malay stock.

Three-fourths of my time in the Philippines was spent among the Christian Filipinos. I landed in Manila on July 9th. My party included Mrs. Thompson, my private secretary, Miss Jones and my executive secretary, Mr. Jappe, as well as representatives of leading metropolitan dailies and the large news services of the country. I remained in the islands three months and during my stay I visited forty-one of the forty-eight provinces. From the time we left Cleveland until we returned we travelled over 40,000 miles.

The Language of the Islands

Concerning the origin of the Filipinos it is known only that they migrated many hundreds of years ago from the islands farther south: that they are an off-shoot from the Malay race which inhabits that part of the world. A few settled on each of the various larger islands of the Philippine group and remained in seclusion there for many years. While they probably started with a common language their isolation on the various islands, or sometimes on the same island but separated by mountain ranges, caused each group to develop its own dialect. There are now eighty-seven dialects and eight distinct languages spoken in the Island. The eight languages are probably as different, as for illustration, the German and Italian languages. In other words, the members of one group have no way of communicating with the members of another group, unless it is done through English or Spanish. Only the educated and well-to-do know Spanish, and they are the small minority. A large number of the younger element knows English. The English language is taught in the public schools. If we retain our influence in the Islands for another twenty-five years, practically everyone will be able to converse in English.

Economic and Political Tendencies

The average mentality of the Christian Filipino is high. Physically small as compared with the races of Western Europe he compares well with the Oriental races. They are an affable and generous people. They love music and outdoor sports. They are quick to learn and adapt themselves readily to the mechanical trades. Their thirst for knowledge leads them to colleges in all parts of the world and fills their school-houses beyond their capacity with the younger people. They are very hospitable. Their custom requires you to sit at their table if you would be their friend. This custom was carried to such a degree that on one occasion I was compelled to partake of six banquets, of from ten to twelve courses each, in one afternoon and evening.

On another occasion, on our return from the 7,500 mile trip around the Southern Islands, my party was stranded in a small fishing village because the ocean was so rough that our little boat could not land. We were compelled to remain over night. Two of the leading families took us in. We were treated to a tasty dinner and comfortable beds for the night and breakfast the next morning. We learned later that both families gave up their entire house to us and slept in their barns. We found that same hospitality whether we were with Senate President Quezon in Manila, Senator Oamena in Cebu, General Aguinaldo in Cavite, or the common people in the provinces.

The Filipino has no inclination toward business or the practical development of the great natural resources. Those who are educated look to the profession of law or medicine, or toward politics for a livelihood, and even those who look to the legal or medical profession, expect in the end to draw their pay from the government. In fact, with the Filipino leader, everything begins with politics and ends with politics.

I was not in Manila long until I learned that the fundamental problem of the Philippine Islands was the political problem; that no economic development could be started until the political status of the Islands was settled finally or for a long time to come. Under the present conditions of political uncertainty outside capital will not invest in the Islands. As a matter of fact, the Filipino leaders are discouraging the admission of capital for investment, fearing it would lead to economic exploitation and retard the day for independence.

I found business at a standstill; time that should have been or could have been consumed in the development of the Islands was being used to discuss the independence question. Filipino labor, which to my mind is the most efficient in the Far East, is emigrating to Hawaii and the United States.

All political activities in the Islands radiate around the independence question. Americans who believe that the independence cry comes from the so-called "Politicos" alone, are mistaken. There are two well-defined political parties in the Philippines, but they differ only on internal matters. Both have the same views on independence. All Filipinos who are interested in public affairs are openly for independence, and no one can be elected to public office unless he advocates independence. I believe that practically the entire voting population is for independence. Of course, only about forty per cent. of the adult male inhabitants have qualified as voters under the Organic Law, which provides for literacy, property and other qualifications. Women do not possess the franchise. How the non-voting population stands on this question can hardly be ascertained, but it is safe to say that the independence movement is growing all the time. Every child in the public schools is taught to cry for independence. The American teachers, sent to the Islands a quarter of a century ago, started the movement and now the Filipino teachers are continuing the work. Some of the most violent advocates of "the independence movement" are Filipino educators who have been trained in American colleges. Most Filipinos do not realize the responsibilities that go with independence. Their leaders never discuss this phase of the question.

Complete Independence Impossible

I believe that complete independence is impossible now, and for a long time to come. As I said in my report, I believe the Philippines lack the financial resources necessary to maintain an independent government. The Islands are too poor to carry on the necessary housekeeping duties of a nation, let alone the expenses of an army, navy, diplomatic corps, and consular service. Practically all the bonded indebtedness of the Philippines is held by citizens of the United States. If the payment of these bonds were made a prerequisite to independence, the Philippine government would have no means with which to redeem them. Then they lack a common language, and for other reasons the Filipinos do not have the homogeneity and solidarity which are the requirements of a strong nation.

A bitter religious feud between the Christian Filipinos and the Mohammedan Moros might accentuate the danger of a civil war should independence be granted at this time. From the standpoint of American commercial interests in the Far East, it would be unwise to relinquish control of the Islands at the present time. We need the Philippines as a commercial base, and their retention will otherwise be of great benefit to our Far Eastern situation. Independence would end the free trade relationship between the United States and the Philippines. This would bring about economic disaster for the Islands. Also, the abandonment of the Philippines at this time might complicate international relations in the Orient.

The independence propaganda might give one the impression that the Filipinos will not be satisfied with anything less than complete, absolute, and immediate independence. During my stay in the Islands, I sought every opportunity to obtain the opinions of Filipino political and business leaders, and to my mind what they really hope for is an early settlement of their relations with the United States on a basis which would give them complete autonomy in internal affairs, but with the United States directing all foreign affairs.

The other phase of the political problem is the breach between the Governor-General and the Legislature. This breach has reached the stage where one branch of the government does not seem to have confidence in the other, and vice versa. Consequently no constructive legislation is possible under this condition. The Governor-General, being a distinguished soldier, naturally has confidence in, and has relied to a great extent upon, his military associates, who have been styled in the Islands as his "Cavalry Cabinet." The members of this cabinet, like the Governor-General himself, have splendid military records, and are gentlemen of the highest type. It is impossible, however, to overlook the criticism that they are unfit for the tasks assigned them, and that, in some cases, they have caused needless friction by tactless methods in their dealings with the Filipino leaders.

The Filipino leaders complain that the Governor-General has virtually destroyed the autonomy, which they acquired under the former Governor-General, and further allege that the Governor-General has actually, although not nominally, established himself as a military dictator, and that he has interfered in local matters. The leaders are continually telling their people that this group of army officers, whose advice, they say, the Governor-General takes almost exclusively, really governs the Islands. This is an unfortunate condition, for it gives the leaders an effective argument. On the other hand Governor-General Wood, when he assumed office, took over the administration of a government, which according to the Wood-Forbe's report, had been run in a reckless manner. Business administration was said to be relatively inefficient, and in some branches corrupt. The financial position of the government was almost hopeless. Under Governor-General Wood's administration, the peso returned to par; the Philippine National Bank, which was practically insolvent, was kept open; and the administration of government departments was greatly improved. At the same time, the Governor-General sought to conduct the government with a strict interpretation of the Organic Act. In so doing, he resumed and exercised many executive powers which his predecessor in office had virtually abandoned.

I am glad to say that I found no evidence of any anti-Americanism, which would necessitate military control. The Filipinos are grateful to the American people for the progress made by them during American contorl.

The Duty of the United States

The United States has a duty to perform towards the Filipino people. We must not abandon these islands to the risk of an independent existence, without reasonable preparation to meet the economic competition or the aggression of the stronger nations. We must not drop the tasks which we assumed a quarter of a century ago until we have satisfied ourselves that the Filipinos are prepared for complete self-government, but at the same time we should not take away from the Philippine people their aspiration to govern themselves whenever they are able to stand alone as an independent people.

While we are preparing the Filipinos for self-government, we should not reduce the internal autonomy which they have been granted, unless their own conduct should make this necessary.

Also while we are preparing them for self-government, we should keep in mind that this entails making the Philippines a going concern in a financial sense. To-day they lack the financial resources necessary to maintain an independent government. The revenue derived from taxes in the Islands amounted in 1925 to only $44,000,000. This would not be enough to support them, if in addition to carrying on their necessary internal activities, they had to pay for many services which our War, Navy, State, and other departments now render without charge to the Philippine people.

With the proper economic and political development, the Philippines would enjoy an era of prosperity such as has never been known in the world.

Recommendations as to Political Changes

The political changes which I believe to be necessary, are as follows:

Steps should be taken at once to re-establish co-operation between the executive and legislative branches of the government. The Governor-General should be provided with the necessary civil advisors and not be required to choose such advisers from the United States army.

The administration of the Philippines, together with our other overseas possessions should be transferred to an independent establishment reporting directly to the President, or to a special insular bureau in one of the civil departments.

The Federal Reserve System and the Federal Land Bank should be extended to the Islands.

During the last two years we have heard a great deal about the British rubber monopoly. I saw rubber raised on the Island of Basilan, where experts said conditions are more favorable than in the Straits Settlements.

With the introduction of capital and the settling of the political questions, the Philippines can raise sufficient rubber, camphor, and coffee to break the monopolies in these necessary commodities which foreign nations now maintain to the disadvantage of the Americans and also of the Philippine people.

I am firmly convinced that we can do most good for ourselves in the Philippines by helping the Filipinos to make the most of their great opportunities.

We must approach all Philippine problems with sincerity sympathy, understanding and friendship. The Filipinos, as a people, are worthy of our confidence and our assistance.

There is much to be done to remove the obstacles to Philippine development that have been raised by misunderstanding and prejudice.

If my efforts contribute anything toward clearing these obstacles, and bringing about a better relationship between the American and the Philippine peoples, I shall feel well repaid, for then I shall know that I have rendered a real service, not only to the one hundred and ten million people of America, but to twelve million more in these far-off islands who need all the help American statesmanship and American business can give them. In meeting these Philippine problems, I am sure, America will measure up to our finest national traditions.

A Hospital Launch for Malay*

British-engined 52-ft. Boat Fitted with Twin-screw Machinery

THE advantages of a mobile hospital and dispensary in many districts overseas have frequently been emphasised, and craft of this type are virtually a necessity where wide areas of marshland make the available waterways the only certain means of communication between various towns and villages.

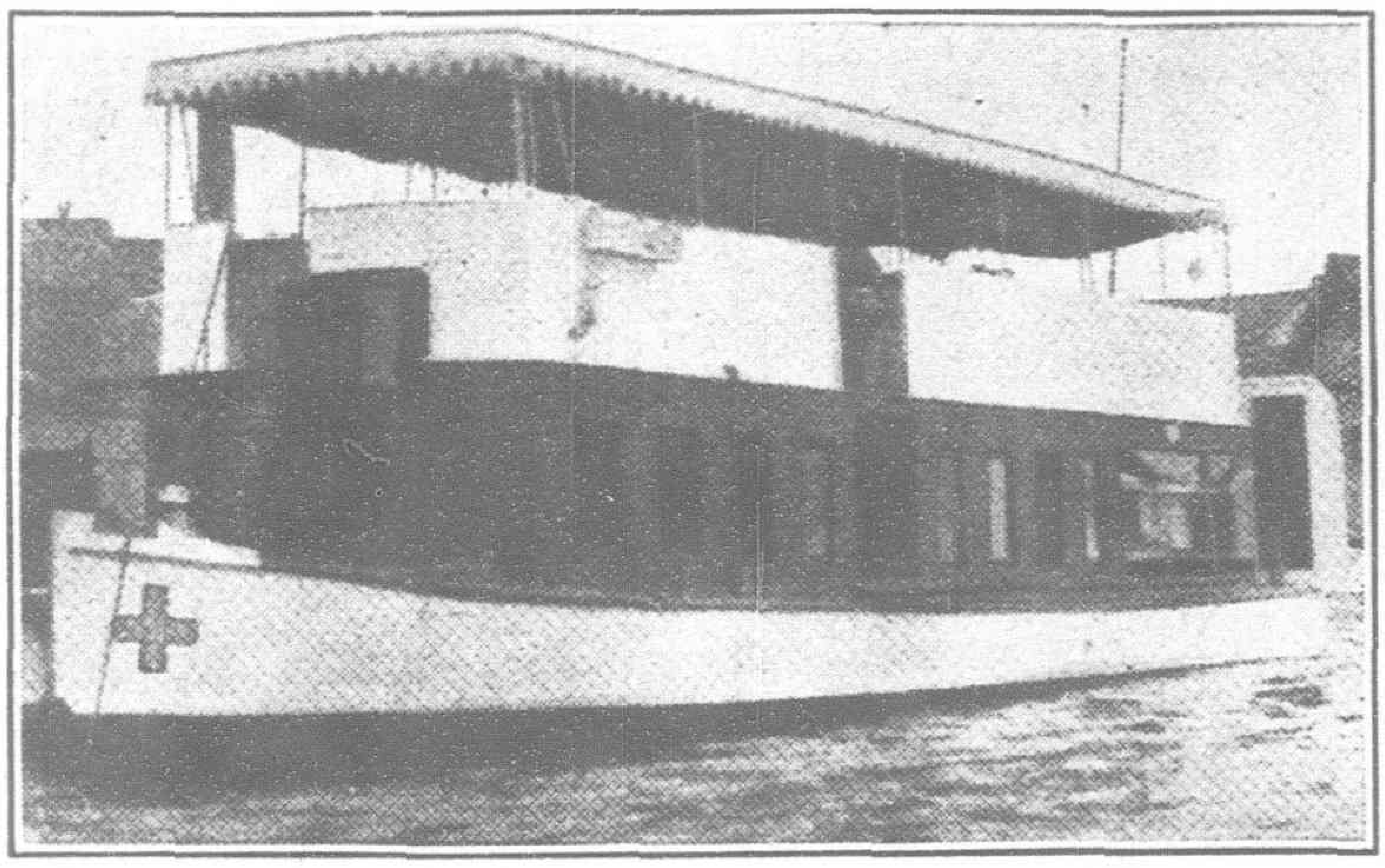
It is for reasons of this character that, some months ago, the Perak Government instructed Messrs. J. I. Thornycroft to build a combined ambulance and dispensary launch, in collaboration with the principal medical officer of the F.M.S. Government, the boat being called upon to comply with the conditions peculiar to the up-country rivers in the Perak State.

One of the principal considerations is shallow draught—an essential feature if certain of the minor streams is to be successfully navigated. In this connection the maximum that could be allowed is only 15 ins. The builders have had considerable experience with the design of shallow-draught boats, particularly in regard to tunnel-stern construction, a system which is embodied in the craft in question and in which the tunnel is arranged to house twin propellers.

A Singapore Production

The actual work of construction was carried out by Thornycrofts (Singapore), whose premises are known, incidentally, as the Tanjong Rhu Shipyards, Malay. The work of the boat will be to visit up-country villages, which would be virtually isolated were it not for water transport, and it is anticipated that the craft will be a considerable asset to the administration of local medical service.

The photographs which we reproduce were taken prior to the completion of the vessel. The interior accommodation provides not only for the comfort of patients, but, in addition, living quarters for the medical officers and staff who are appointed to the launch. The sick-bay is provided with an operating table, dispensing table and cabinet, sink, poison cupboard, shelves and other more minor items of equipment.



A 72 h.p. Motor Boat for Medical Service. A Repeat Order was Placed upon the Completion of the Trials

Unusual Arrangements

Portable lifting gangways are fitted adjacent to the sickbay, and these can be lowered at villages *en route* and so enable the patients to enter the sick-bay from the river bank or stand on the gangways and receive inoculation, as may be desired. To ensure the utmost cleanliness all tables, cupboards and certain other furniture are faced with plate-glass, whilst mosquito-proof screens are fitted to all windows and doors.

The boat will be based at Teluk Anson and operate from this point along the Perak River. Two medical officers will be carried permanently, together with dispensers and dressers, whilst full facilities are provided for operations to be carried out aboard the boat if necessary. The furnishing and equipment generally are of such a nature as to ensure both efficiency and comfort for all concerned. A roomy upper deck with permanent sun awnings occupies practically the whole length of the boat.

The dimensions of the boat are 52-ft. overall, with a beam of 12-ft. The power plant consists of a pair of four-cylinder 36 h.p. Thornycroft motors, each fitted with reducing and reversing gears. With this power the boat is able to attain a speed of 10¼ m.p.h. Upon completion the craft recently proceeded to Teluk Anson from Singapore under her own power, the distance being 320 miles, and this was covered in just under 36 hours, no stops being made, for the cruising radius is considerable.

On arrival at her destination trials were carried out, at which the Sultan of Perak, together with Government officials, were present. That the boat proved completely satisfactory may be judged from the fact that a repeat order was immediately placed by the Pahang Government for an exactly similar boat. A valuable feature of the craft is the ease with which she may be manœuvred when under way, the vessel answering the helm with the utmost facility. This is important, as it is not unusual for tunnel-stern craft to be somewhat difficult to handle.

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*The Motor Boat

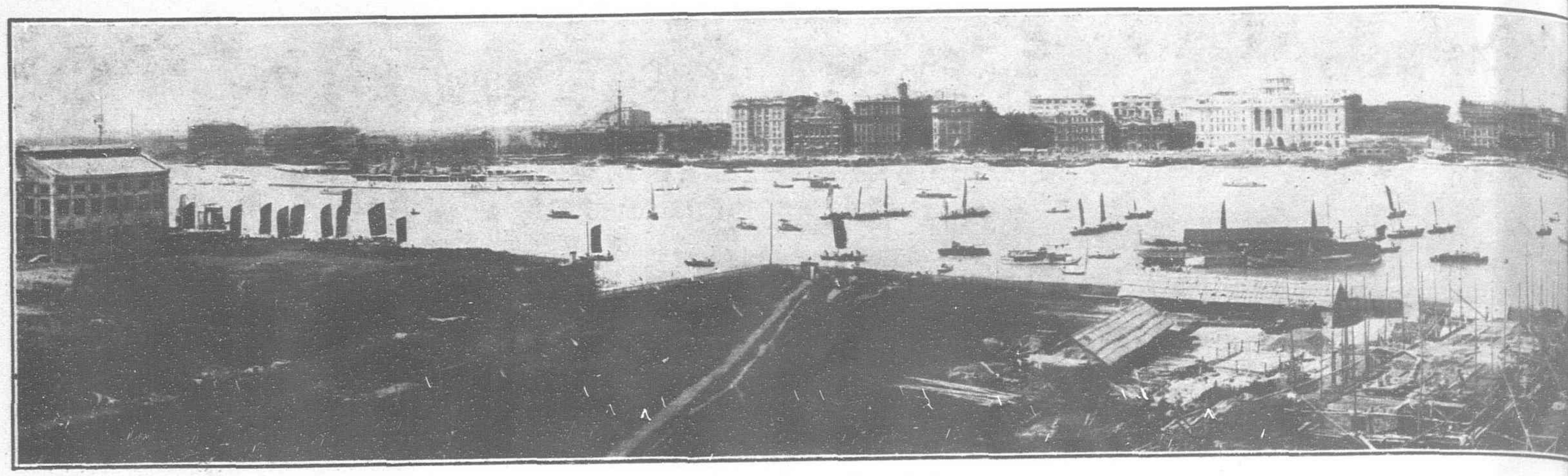
Economic Conditions Along Taonan-Angangki Railway

The Taonan-Angangki Railway traverses a large tract of fertile land rich in agricultural products. Taonan, a gateway leading to Eastern Mongolia, is growing in importance commercially, with annual exports worth about $5,000,000 and imports from $3,000,000 to $5,000,000. Goods shipped from Taonan station along Taonan-Ssupingkai Railway in 1925 amounted to 94,599 tons, while the in-coming freight came to 99,581 tons, as compared with 64,000 tons and 15,000 tons respectively in 1924. About 90 per cent. of the goods consisted of cereals. Of these goods, 68 per cent. were shipped by Chinese merchants and 32 per cent. by Japanese ; 45 per cent. being destined to Dairen, 30 per cent. to Ssupingkai, 15 per cent. to Antung and 5 per cent. to Newchwang.

The Taonan-Angangki Railway transports produce from eight districts along the line, namely, Taonan, Ankwang, Lichuan, Tsingan Chentung, Talai, Tailaichi, and Kingsingchen. The following table shows the area of cultivated land and production of cereals in these districts in 1926 :

District	Area of Cultivated Land	Yield of Cereals
Taonan ..	.. about 800,000 *mow*	250,000 piculs
Ankwang	.. ,, 650,000 ,,	130,000 ,,
Lichuan	.. over 400,000 ,,	120,000 ,,
Tsingan	.. about 900,000 ,,	280,000 ,,
Chentung	.. ,, 400,000 ,,	120,000 ,,
Talai ..	.. ,, 550,000 ,,	680,000 ,,
Tailaichi	.. ,, 140,000 ,,	80,000 ,,
Kingsingchen ..	,, 400,000 ,,	150,000 ,,

Among the banking institutions at Taonan, there are branches of the Bank of China, Bank of Communications, Government Bank of Manchuria, Commercial Bank, Hing Yeh Bank, Fengtien Savings Society Fengtien Yu Min Savings Soceity and a number of native banks including the Fu Ho Chang and Tsi Ching. Most of these banks have invested heavily in land, leaving little spare money for ordinary commercial transactions. The merchants constantly suffer from the tight money market.



The Bund, Shanghai

Shanghai's New Billion-Dollar Skyline

BANKS of lights from faintly delineated skeletons—the skyscrapers of the New York of the Far East—dazzle the traveller approaching Shanghai at night. It is not the towering, Christmas-tree magnificence of Hongkong, nor yet the black giants with glowing coals in their eyes one sees in nocturnal Manhattan, but Shanghai has one of the most impressive "*front drops*" in the world, and gradually the skyline is filling in and being built up to rival any port of the West. It already has surpassed many in the architectural beauty and symmetry of its approach, and has no peer in the Orient. The Bund is a jewel in which Shanghai is taking more and more pride.

Transformed entirely, like the rest of the city, during the past decade, by the erection of several tall new buildings, the Bund is undergoing yet another quick transformation at the present moment —one that will elevate the skyline a few stories more, add several pinnacles to its horizon, bring greater harmony to its architectural scheme and pave the way for untold future developments. At the current rate of progress it will not be long before Shanghai can boast a billion-dollar shop-front.

Two huge units in this panorama that so amazes the visitor are to be completed within the next year or so. One is the new Customs Building, covering one city block, with a clock-tower nearly 300 feet above the street level, and flanked by two wings that will render it a replica of some of the famous office buildings of London and New York. It will be, for a time at least, the tallest building in Shanghai, a landmark visible, like the Customs tower at Boston, for miles about.

The other building that is soon to fill in a gap in Shanghai's long front-window stretch is the Sassoon House, another twelve-story office arcade building of slightly flat-iron proclivities, likewise rising approximately 300 feet above the boulevard, and covering a whole block. The cost of this structure is the same as the Customs House, about Mex. $4,000,000.

A third addition to the Bund is planned in the proposed new home for the N. Y. K., while a fourth, that of the Bank of Taiwan, has just been completed. Just round the corner from the Soochow River end of the Bund and visible to anyone on the deck of a steamer in the Whangpoo, still another large structure, and Shahmoon Building, combined theater and offices, at the corner of Soochow and Museum Roads, is rearing into the jagged skyline. Also along Museum Road are two other office buildings of sizeable dimensions and a Synagogue, while Szechuen Road, one block behind the Bund and parallel to it, furnishes sites for several more such enterprises, including the Bank of East Asia, which, together with the Shahmoon Building, is to be "unveiled" within two or three months. At the corner of Kiukiang and Szechuen Roads, another tall structure, the new China Press building, is to be erected, and one block further away, a sixth office building is in progress of construction.

Building in Shanghai, in fact, is progressing at an amazing rate, considering the general business depression. Although no new ventures of consequence have been launched recently those already under way will keep armies of laborers and scores of contractors busily at work for the next year or two. One can scarcely travel a block in the business or residential sections of Shanghai without seeing construction work on office buildings, apartment houses or shops. The architects and the business firms besides have been drawing up plans on an even vaster scale than those already mentioned and the next cornerstones to be laid on the Bund will be for buildings of sixteen fioors.

A glance at the *China Architects and Builders' Compendium* for 1927 bears this out, incidentally offering an index to the prosperity of this Occidental metropolis in the Orient. During last year, it was higher than at any other time. A table, giving a comprehensive summary of building during the last five years indicates the pace of progress. It will be noted that, while the number of buildings in process of construction or built in 1926 was less than in 1925, the estimated value is 50 per cent. greater :

Description	1926	1925	1924	1923	1922
Chinese houses	5,160	7,734	5,293	5,634	4,267
Foreign buildings	108	141	73	208	84
Foreign residences	97	127	128	162	128
Godowns	21	19	27	38	28
Stables and garages	85	62	59	59	73
Work sheds	50	53	56	76	109
Miscellaneous	704	817	1,037	1,081	773
Mills and factories	22	13	20	14	25
Totals	6,247	8,966	6,693	7,272	5,487

Estimated Value in Taels: 1926, 21,147,240; 1925, 14,874,700; 1924, 12,445,030; 1923, 13,030,400; and 1922, 15,926,600.

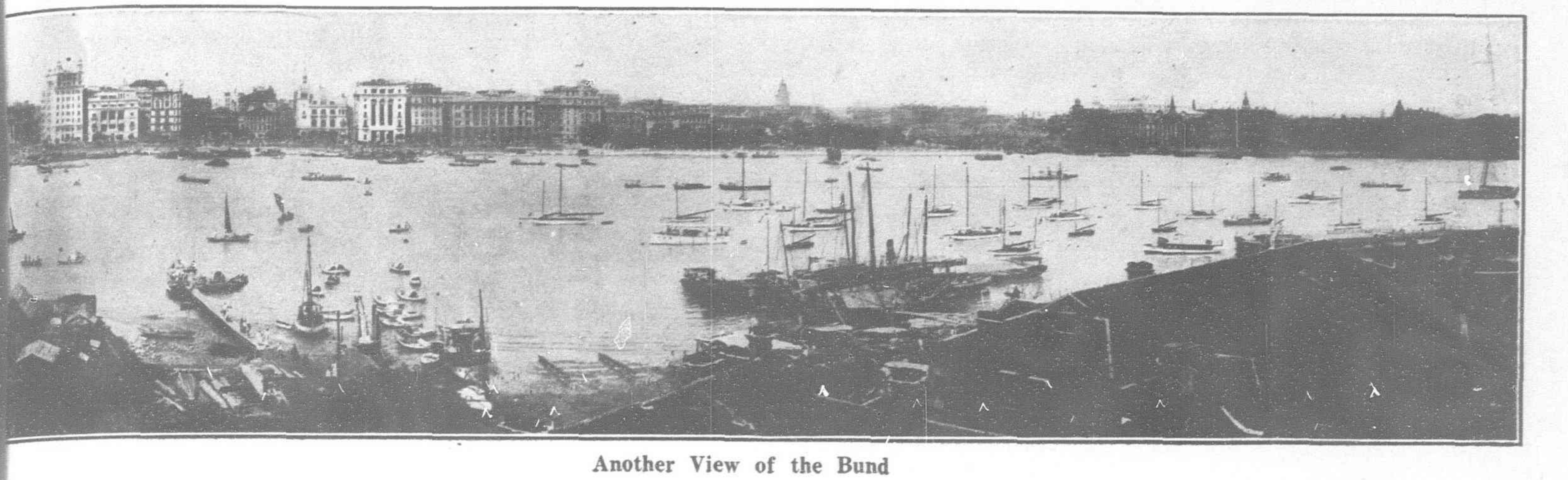
Plans subimtted for approval 2,111 … { 729 by Foreigners.
1,382 by Chinese.

And this, of course, does not represent the value of the land bought or leased for these purposes. Along the Bund, along part of Szechuen Road, and on Nanking Road as far as Chekiang Road, land early in 1927 had an approximate market value of Taels 200,000 per mow or more, while in the rest of the downtown business district, it had mounted to as high as Taels 100,000 per mow or over. And land values, despite prevailing conditions, have held to a high level, in one or two instances even increasing.

In the erection of these half a dozen large buildings in the central district of Shanghai, a total of no less than fifteen million taels is going into the construction alone, the value of the land running into a total many millions higher.

Most of those now planned or being constructed in Shanghai are height-limit structures, the legal maximum in most cases being one and a half times the width of the street on which they face, but on the Bund there is no restriction, so the possibilities for skyscrapers along the waterfront boulevard are unlimited.

Architecturally, it is true, the Bund and buildings generally throughout Shanghai present somewhat of a conglomeration. They



Another View of the Bund

have been designed by numbers of craftsmen of different nationalities and concepts of style and at no time has the Municipality made an attempt to enforce harmony in any locality. It is partly by chance, therefore, that the diversity offered to the visitor here, is so pleasing to the eye, and that the recently erected Yokohama Specie Bank, Taiwan Bank, North-China Daily News and Hongkong and Shanghai Bank buildings, the new Customs Building and Sassoon House, will blend so admirably. The Palace Hotel and the Old German Club, now occupied by a Chinese bank, are still somewhat out of place, but these will not survive the skyward impulse for long.

Palmer and Turner are the architects for both of the new important buildings, and, having designed the Hongkong and Shanghai Bank Building, it is only natural that this Shanghai firm should follow out models that would fit into the scheme of things in their later designs. The new Customs House and the Sassoon House match closely the large bank building, with certain fundamental variety, partly due to the odd shapes of the sites, the use of different materials and certain perculiar engineering problems which enter into every large construction enterprise.

The New Custom House

The general design of the building has been treated in a restrained classic manner and an endeavor made to suggest by its outward appearance the purpose of the structure. The traditional Custom House tower will be the centre of the Bund. The entrance portico follows a pure Doric Style, the inspiration being taken from the Parthenon at Athens. Ships and gods of the sea will be portrayed in the metopes of the frieze and much of the ornament will be symbolical. Vertical lines predominate from the 3rd to the 7th floor to accentuate the height, in contrast to the long, horizontal lines of the Hongkong and Shanghai Bank, which has a frontage to the Bund of much greater length. The major portion of the tower is of simple masonry in order to give prominence to the clock.

The whole of the Eastern block on the Bund will be faced with granite. The tower is also of granite but the extremity is covered with copper. The facades on the Hankow and Szechuen Roads will be of brick made by the Kailan Mining Company, with the exception of the facing of the ground floor and certain ornamental features which will be carried out in granite. The walls of the courtyard will be of white glazed tiles in order to give ample light to those offices served by this area with an impervious red brick facing on the ground floor. All the windows throughout are of metal with external metal shutters or external sunblinds. The windows on the Bund frontage will be constructed of solid bronze.

Plan of Building

The building has a frontage of 131 ' O " on the Bund, 450'O" on the Hankow Road, and 162'O" on the Szechuen Road. Its total capacity is 5,943,000 cubic feet. The height to the top of the flagmast is 281'O" from the pavement, there are 10 main floors overlooking the Bund, 5 floors on the Hankow Road, 6 floors facing Hongkong Bank, and 5 floors on the Szechuen Road frontage.

Description of the internal arrangement of the building can be abbreviated by assuming that there are three blocks ; the eastern or front block on the Bund ; the central, to the South and North of the long interior courtyard ; and the western, or back block, on Szechuen Road. The main entrance is from the Bund leading to the 6 passenger lifts and the principal staircase. There are two secondary entrances from Hankow Road, each having a staircase and 2 passenger lifts. A heavy goods lift and staircase on the south side of the building is approached from the courtyard, and there is a fifth staircase and passenger lift in the south-west corner of the building. There are 2 carriage entrances to the main courtyard.

The three main entrance doors and windows will be of richly ornamented bronze work, and these will open upon the entrance hall. The walls of the hall will be panelled in various selected marble and the piers will be covered with the same material inlaid at the corners with mosaic. All metal work including a large central lighting standard fitting and the lift enclosures will be of bronze. The mosaics will typify scenes in connection with Customs activities.

To the right of the entrance will be situated the offices of the chief Tidesurveyor, his assistants and candidates. Next to these on the north side of the building are the boxholders' room and waiting room. On the left, on the south side of the building are the offices of the transport officer, his strong room and godowns. The courtyard in the center will be covered with "Calorex," a glass which admits light but excludes heat, immediately above the ground floor, and from here the heating plant, switch, tank and fan rooms can be approached. Situated also around this courtyard are a carpenters' shop, garages for cars, a ricsha store, godowns for lights, and two large godowns in the back block for the works department ; there is in addition space to be occupied by the Bank of China. In the south-west corner on the ground floor there is a dormitory for servants with lavatories, kitchen and dining rooms.

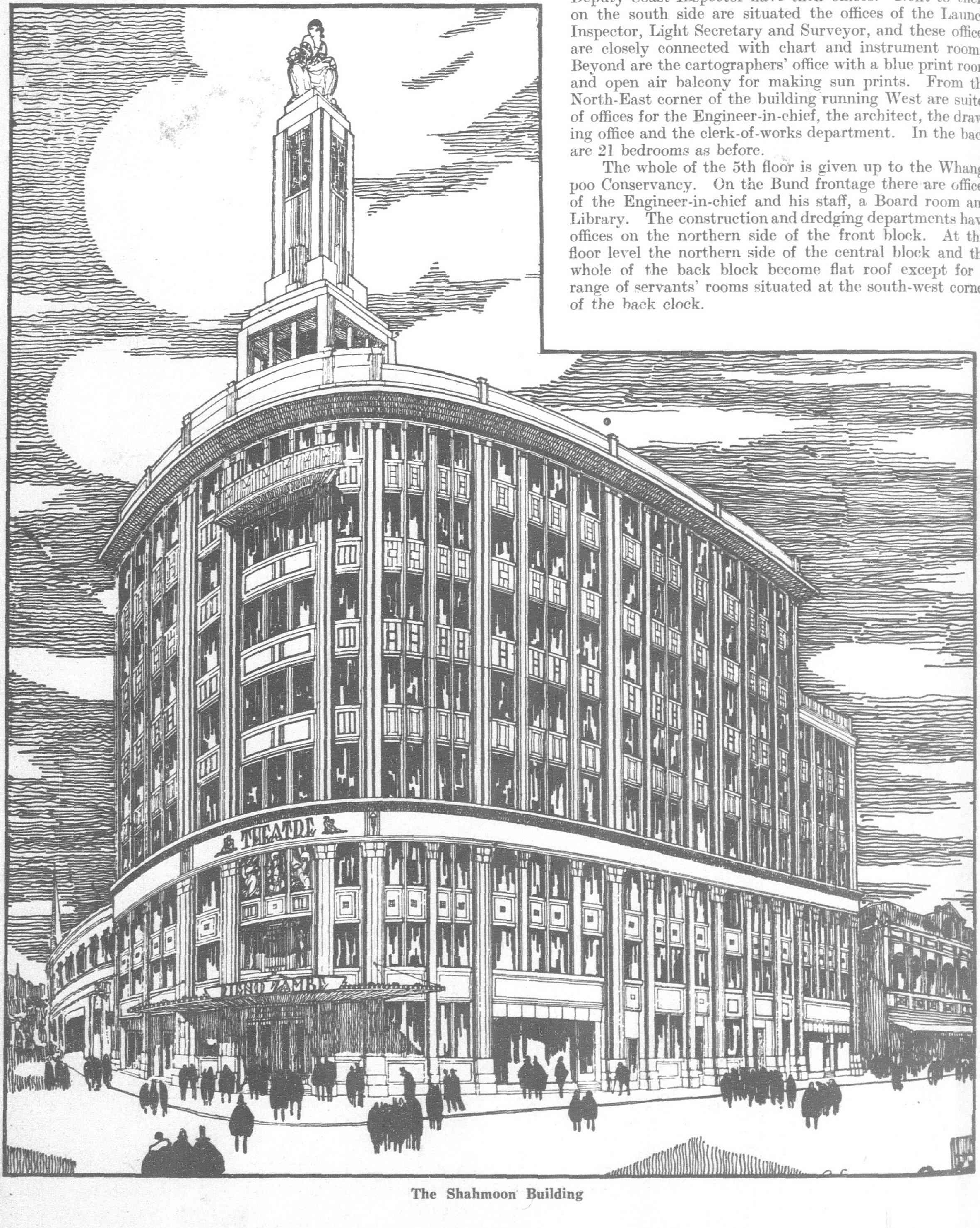
On the 1st floor the extensive general offices are so placed that they can be approached from no less than 5 staircases and 4 batteries of lifts. The Deputy Commissioner and staff in charge of this Department have private offices conveniently situated so that they may supervise work of their department. There is apace also in the central block for considerable future extension of the general office. Throughout the building on the upper floors, lavatories for both Chinese and foreign staff are situated around the staircases in the centre of the building. Every part of the building is accessible by means of covered passages across the courtyard. In the back block of this are 4 tiffin rooms, each having its own kitchen and pantry. The tiffin room for the indoor staff can seat 40 persons, that for the outdoor staff 50, that for the clerks 320, and that for the tinchais 144.

The Appraising Department, sub-divided into 6 sections, is situated at the eastern end of the building on the second floor. Offices for a Deputy Commissioner and for the chief appraiser are on the Bund frontage. On the South side of the central block there is a laboratory and strong rooms together with offices for the Inspector of Samples. In close connection with these offices is a specially constructed sound-proof examination room with storage for samples from the wharves adjacent. On the north side of the courtyard there is a large sample room with ample space nearby for the future extension of the department. In the back block there are 15 bedrooms with service rooms, bathrooms and lavatories. A sitting room and a private dining room are planned in close connection with a large mess room and kitchen and pantry.

Facing the Bund on the 3rd floor, the superintendent and his staff have their offices in the North East corner. In the South-East corner there are extensive offices for the commissioner, his secretary and staff. Between these two suites is a large spare office. The accountant, his clerks' and strong rooms are on the north side of the building and the Returns offices on the South side. There is considerable storage space for archives on the north side in connection with the accountants' department. In the back block there are 21 bedrooms with bathrooms, lavatories and large service room.

On the 4th floor in the front block the Coast Inspector and Deputy Coast Inspector have their offices. Next to them on the south side are situated the offices of the Launch Inspector, Light Secretary and Surveyor, and these offices are closely connected with chart and instrument rooms. Beyond are the cartographers' office with a blue print room and open air balcony for making sun prints. From the North-East corner of the building running West are suites of offices for the Engineer-in-chief, the architect, the drawing office and the clerk-of-works department. In the back are 21 bedrooms as before.

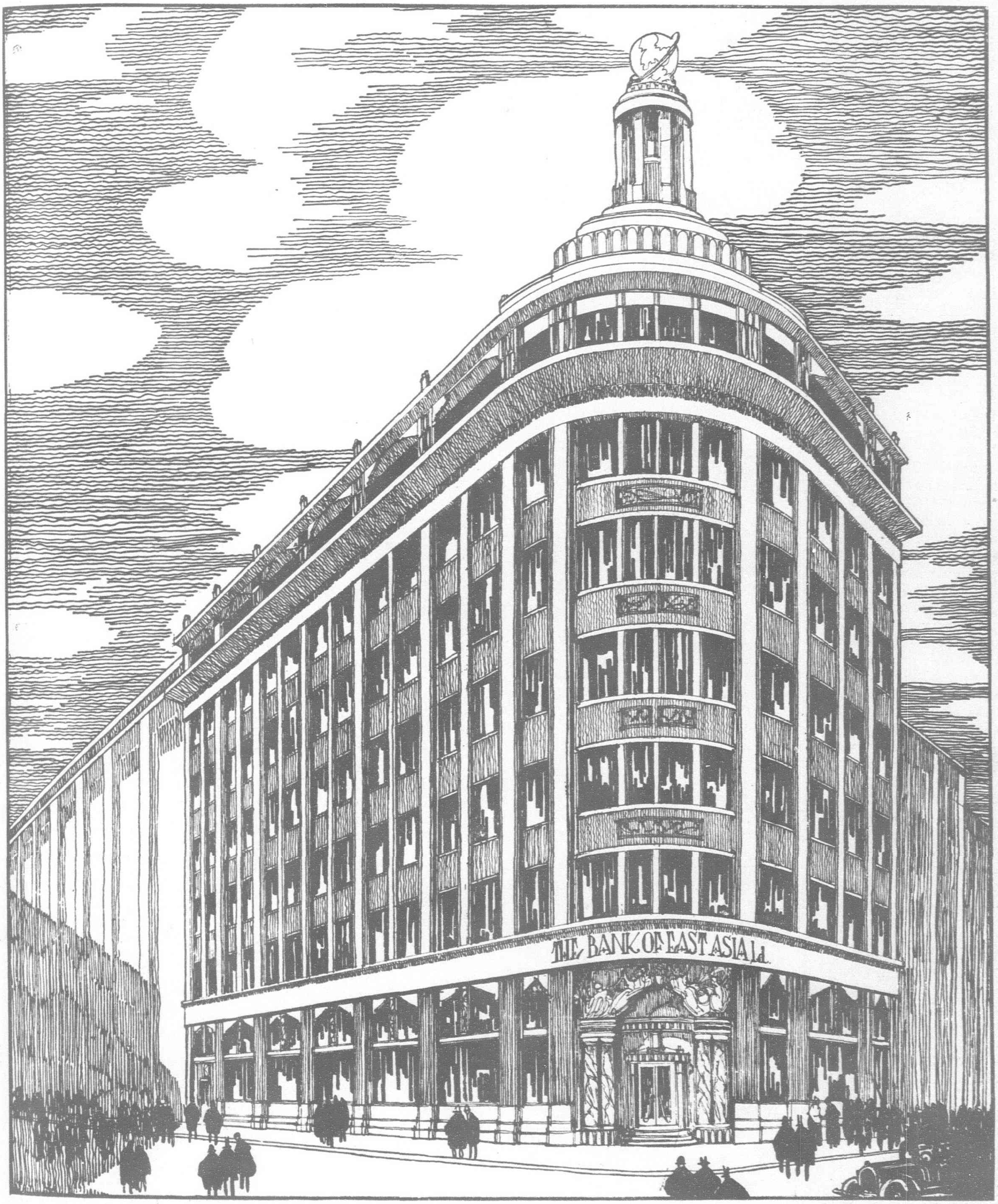
The whole of the 5th floor is given up to the Whangpoo Conservancy. On the Bund frontage there are offices of the Engineer-in-chief and his staff, a Board room and Library. The construction and dredging departments have offices on the northern side of the front block. At this floor level the northern side of the central block and the whole of the back block become flat roof except for a range of servants' rooms situated at the south-west corner of the back clock.



The Shahmoon Building

On the 6th. floor five flats are planned; three in the front block and two on the south side of the courtyard. There is a large hall, dining and drawing rooms, 3 bedrooms and 2 bathrooms to three of the flats. The remainder have respectively hall, dining room, drawing room, 2 bedrooms and 1 bathroom. There are ample verandas, cupboards and servants' quarters in every flat. On the 7th. floor under the tower are servants' rooms for the flats below and very extensive storage archives.

On the 8th. floor will be found two large flats under the tower, each having a large hall, dining room, drawing room, 4 bedrooms


THE BANK OF EAST ASIA Ld.

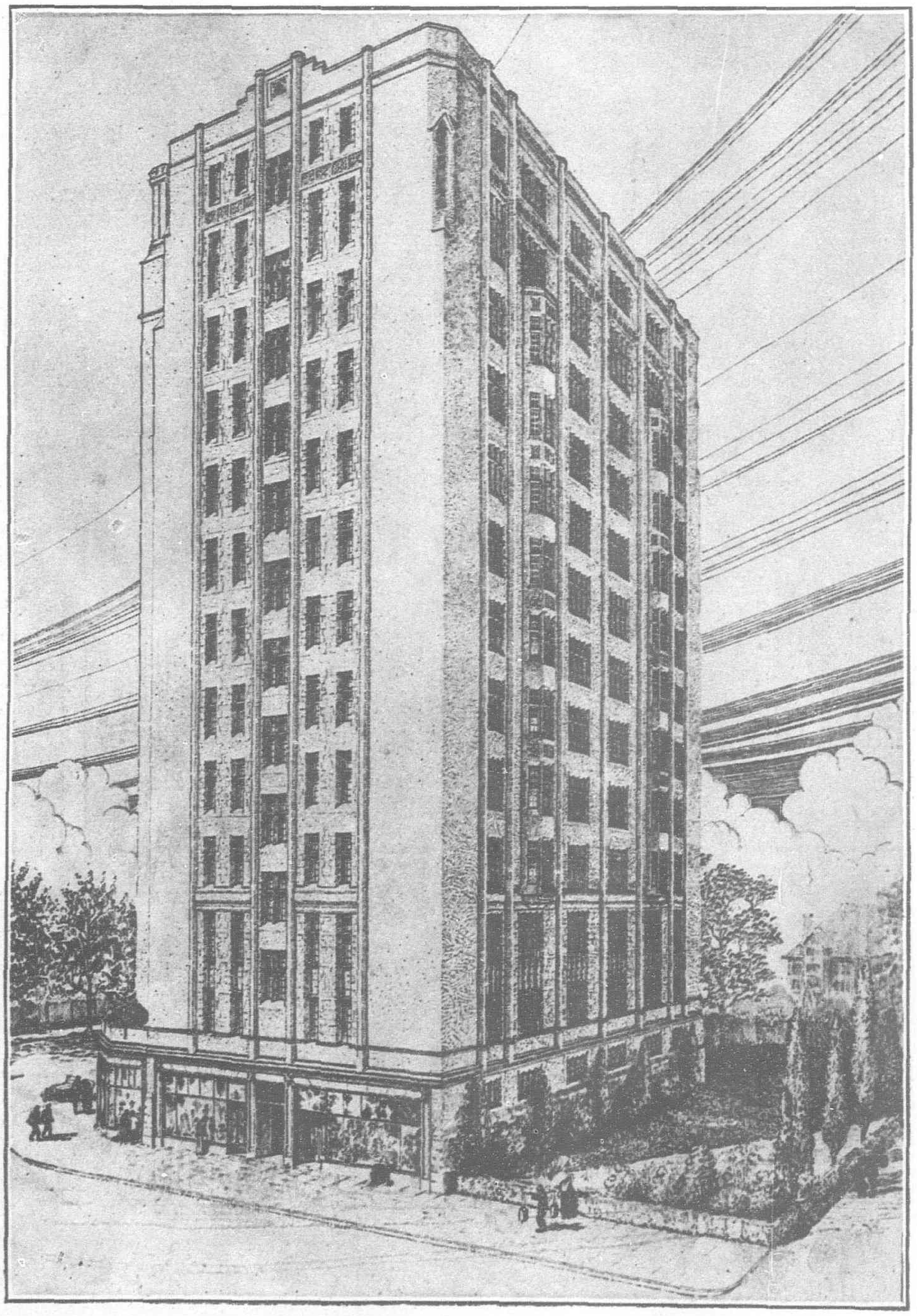
Building of Bank of East Asia

and 3 bathrooms. On the 9th. floor are servants' rooms for the flats below and lift motor rooms. Above this level in the tower the several floors provide accommodation for the clock machinery, wireless telegraphy and signal plant.

Generally, the interior of the building will be finished in such a way that the cost of maintenance can be reduced to the minimum, and in such a way that the large public spaces can be readily cleaned. All the floors in the public spaces and corridors will be of mosaic and the counters of marble with glass or vitrolite tops and all metal-work accessible to the public will be almost entirely of bronze. The flooring of the offices except those mentioned above will be of damerlaut, and that in residential quarters of oak. The senior officials' rooms will have panelled walls and enriched plaster ceilings.

The Construction of the Building

The whole structure is built upon a raft The raft takes the form of a continuous slab of reinforced concrete varying in thickness from 16 to as much as 24 inches under the tower. It is stiffened by ribs in both directions. These ribs forms reinforced concrete beams and are generally about 22 feet apart ; they have normally a depth of 6 feet, including the bottom slab, but under the tower they are increased to a depth of 9 feet. The steel columns of the superstructure rest upon the tops of these beams at their intersection. Under the tower the total load coming down upon 4 small areas under the 4 corners is 6,700 tons, and this load is distributed by the raft over an area of approximately 3,600 square feet. Of this total load 2,240 tons are carried by the direct action of the soil on the raft and 4,460 by the 225 concrete piles in this area. The piles are of reinforced concrete 50 feet long and 16 inches square. The surface of each pile is serrated to give additional friction resistance.



A New Apartment House Opposite the French Club

The soil upon which this building rests can only be described as soft mud. Bore holes have been sunk in Shanghai to a depth of 400 and 970 feet but instead of coming across more solid matter, the substance remains soft mud for the whole of its depth. The piles therefore do not rest on anything more solid than that on which the raft is built, but they add considerably to the resistance of the raft by virtue of the additional skin friction between them and the mud. Or, from another point of view they transfer part of the pressure from near the surface where the carrying capacity of the soil is slight to a lower level where the soil, though quite as soft, has a higher carrying capacity by virtue of its depth.

It will be readily understood that to transmit these heavy loads over so small an area requires very considerable strength in the reinforced concrete beams. The main steel roads are $1\frac{1}{4}$-in. in diameter, and the largest beams have 16 such rods in their tension side. The shear strength has to be very carefully considered with beams of this kind, and both bent-up rods and stirrups have been used for this purpose

One of the difficulties of building on soil of this kind is that even after taking all these precautions considerable settlement will be experienced. Settlement cannot be avoided and is not dangerous to the structure provided the whole building settles at the same speed and the same amount. To ensure this it was essential to proportion the carrying capacity of the back of the raft to its particular load so that no portion should tend to settle more than any other. This has been effected by so distributing piles as to provide for each section of the raft exactly the additional resistance required over and above what the soil itself will carry. In structures of this kind it is just as dangerous to increase the bearing value by excessive piling of one part of the site, which will be lightly loaded as to space the piles too far apart, because the part that is over piled would fail to settle with the rest and cause the building to lean.

The safe pressure on the soil permitted by the local authorities is only 1,700 lbs. per square foot, and it is remarkable that buildings of this magnitude can be erected in Shanghai. It is usual to estimate beforehand what the probable settlement of large buildings will be and to build the structure above its final level by this amount. In designing buildings for the Hongkong Bank, the Chartered Bank, and the Yokohama Specie Bank, the ground floor was made at a level of 12-in. above the position where it was thought likely to come to rest. Temporary steps were erected from the street and were removed one at a time as the settlement proceeded. Actually the movement of the Hongkong Bank up to the summer of 1924 was approximately 4 to $6\frac{1}{2}$ inches.

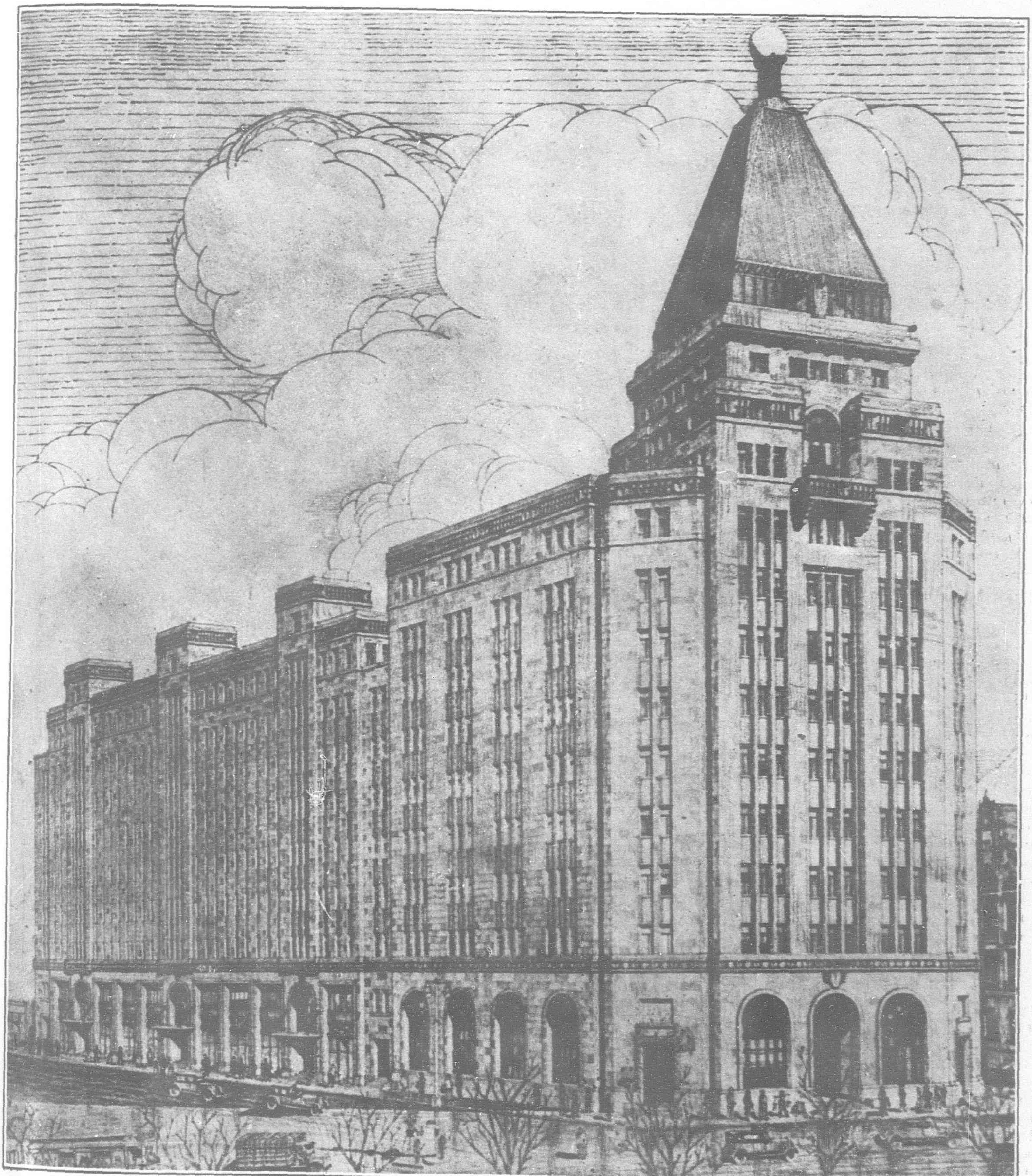
Artificial ventilation will be provided by an electrically driven forced draught system. Foul air will be drawn automatically from the main floors of the building and fresh air, treated on the "Ozonair" System, will be pumped in. The boilers for the low pressure hot water heating system and the hot water services to the lavatories will be fed with oil fuel, and to ensure fuel economy and control of smoke nuisance.

The building is to be completed in December this year.

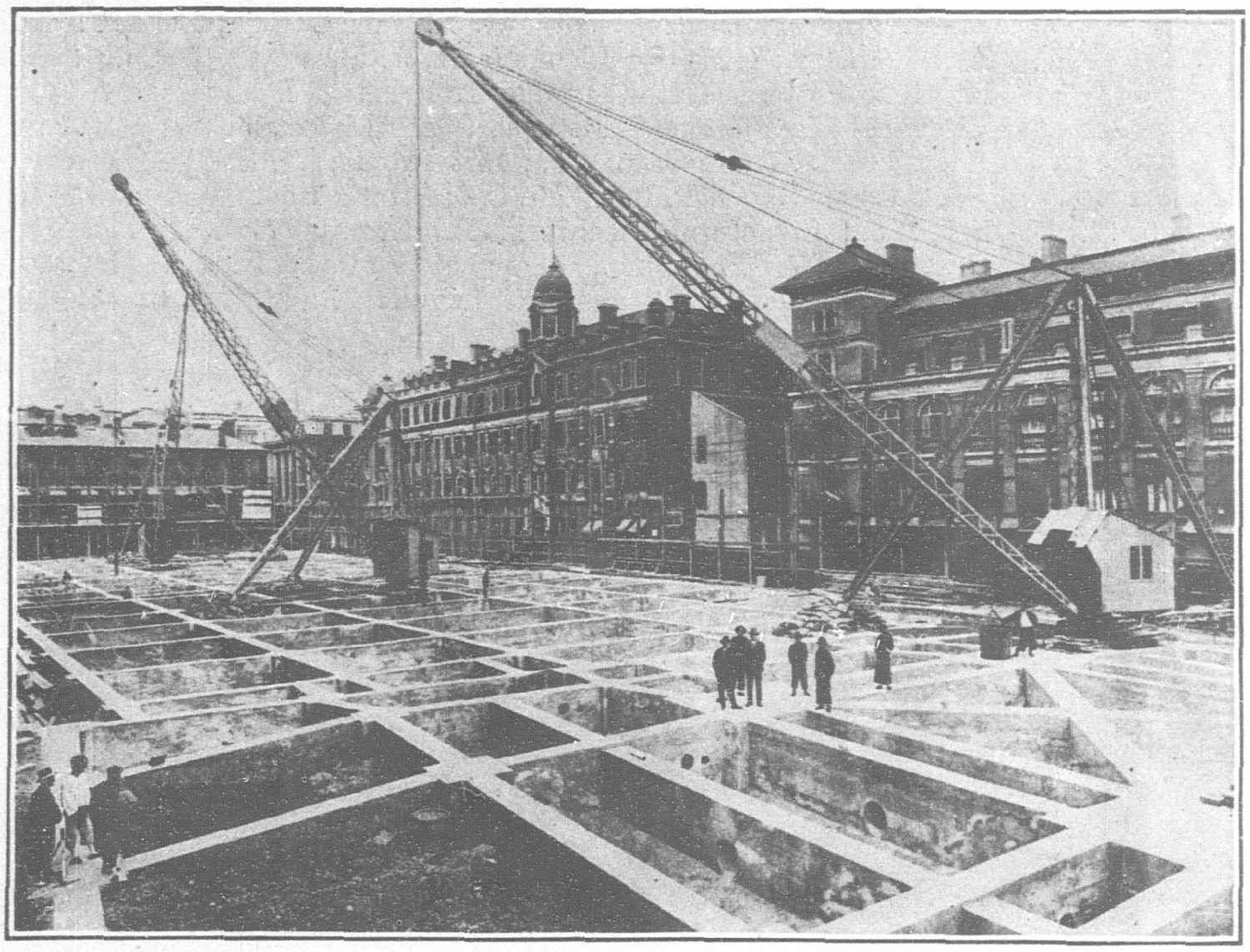
Contractors

The contractors for the Custom House follow :—

General Contractor, Sin Jin Kee ; Steel and Bronze Windows, Borrowed lights and Venetian Blinds, Henry Hope & Sons ; Skylights, Bronze Doors and Screens, General Decorative Bronze Work, and Electro-Glazing, Luzfer Prism Co. ; Tower Clock, J. B. Joyce & Co. ; Interior Clocks, Gent & Co. "Pulsynetic" ; Bells, Taylor Bell Foundry ; Glass for Clock Faces, J. B. Joyce & Co. ; Steel Shutters, Potterax Gate Co. ; Cast Iron Gates., MacFarlane & Co. ; Electrical Installation & Fittings, General Electric Co. ; Lifts and Book Lifts, Otis Elevator Co. ; Lift Fronts, W. S. Tyler & Co. ; Book Room Doors, Ratner Safe Co. ; Strong Room Doors, Chubbs Safe Co. ; Structural Steelwork, Braithwaite & Co. ; Heating, Ventilation & Plumbing., Shanghai Waterworks Co. ; Marble, Ceramic & Mosaic, B. Bertucci Esquire ; Lightening Conductor,



Sassoon House, Shanghai



Complete View of the Foundation of New Customs House, Shanghai

Jardine Engineering; Calorex Glass, Chance Brothers; Bricks, Kailan Mining Admins. Granite, S. V. Chen Kee; Decorative Joinery, Tai Chong; Floors, G. W. Mc'Bain & Co.; Glass, Pilkington & Co.; Tiling, Duncan & Co.; Waterproofing, Duncan & Co.; Sanitary Fittings, Shanks & Co.; Boilers, General Electric Co.; Artesian Well, China Deep Well Boring Co.; Deep Well Pump: John. I. Thornycroft & Co.; Painting, R. H. Felgate & Co.; Locks and Door Furniture, N. F. Ramsey & Co.; Stair Treads-"Alundum", William Jacks & Co.; Steel Furniture, Ronco Ltd,; Wood Furniture, Tai Chong & Co.;

Edwin F. Bothwell, F.R.I.B.A., was the architect directly in charge of the work on the Customs House.

The Sassoon House

Confronted with some of the most intricate engineering problems that have been encountered in the Far East, the building of the Sassoon House, another twelve-story structure on the corner of Nanking Road and the Bund, is going forward at a pace which ensures its completion some time next spring.

For the first time, Raymond composite piles, with a forty-foot wooden section underneath a 22-foot steel-encased concrete section, were used in Shanghai, the first of the 1,600 piles being driven early last spring, and the last on May 1, this year. The raft was designed on an inverted T-beam system, having pedestals supporting the stanchion bases. The pedestals absorb a considerable amount of the negative moment at the support. The total settlement of the wooden section under a load of 107,000 pounds was found to be 9/32 of an inch, the exterior of the raft being water-proofed. The dimensions are 325 feet by 188 feet. An interesting feature of the raft is the stepped foundation to the heating chambers, necessitated by the peculiar shape of the plan at this particular point.

Another important feature of the design is the manner in which the rotunda floor is being constructed. The main beams of this portion rest upon short cantilevers projecting from the adjacent raft proper and have no direct bearing whatever upon the soil. This method of construction was adopted on the rotunda section because of the great difference of the loading over this area in comparison with the remainder of the raft. The rotunda floor has been floated so as to sink independently in case of a settlement of the main building.

The structure at all floors is on a short axis. The steelwork is unusually well-braced to resist stress by wind or earth movements, with more than the ordinary precautions taken for the upper portion of the tower. There will be eight full-width floors on all sides, with twelve facing on the Bund. The height of the building will be 240 feet over-all. Structural steel and reinforced concrete are the main materials.

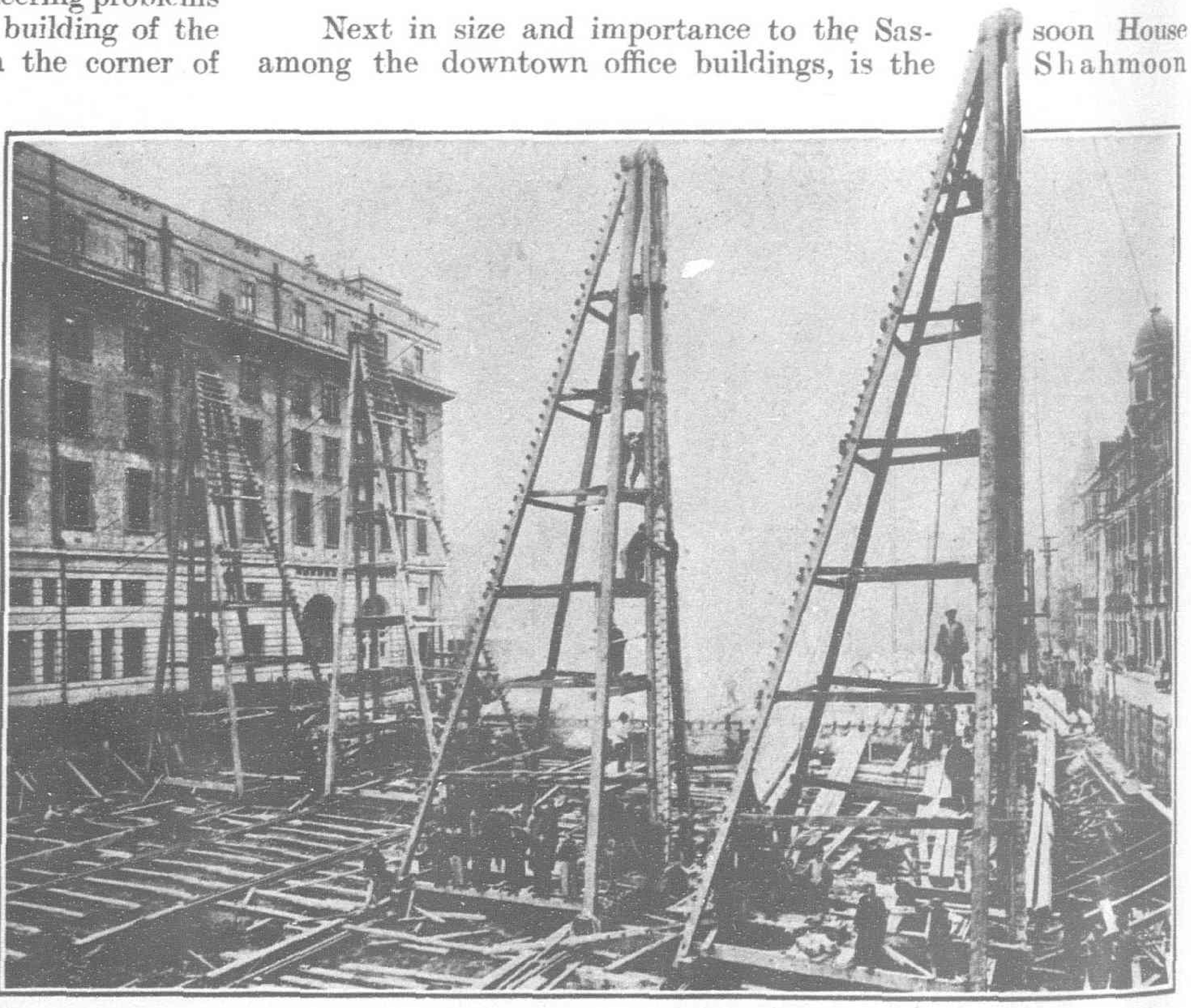
The rotunda in the center on the ground floor is for three arcades, one each from Jinkee, Nanking, and Yuenmingyuen Roads, which are to be lined with shops. Banks are to take most of the remaining space on the ground floor, while above will be offices, apartments, club suites, and a restaurant. Ten lifts are to be installed. The E. D. Sassoon Company, for whom the building is being constructed, anticipate an expenditure of Taels 3,000,000.

In the design and construction of this building, Messrs. G. L. Wilson, F.R.I.B.A., P.A.S.I. and F. J. Barrow, A.R.I.B.A., M.IST.E., were the architect and engineer, respectively, for Palmer and Turner. The contractors follows:

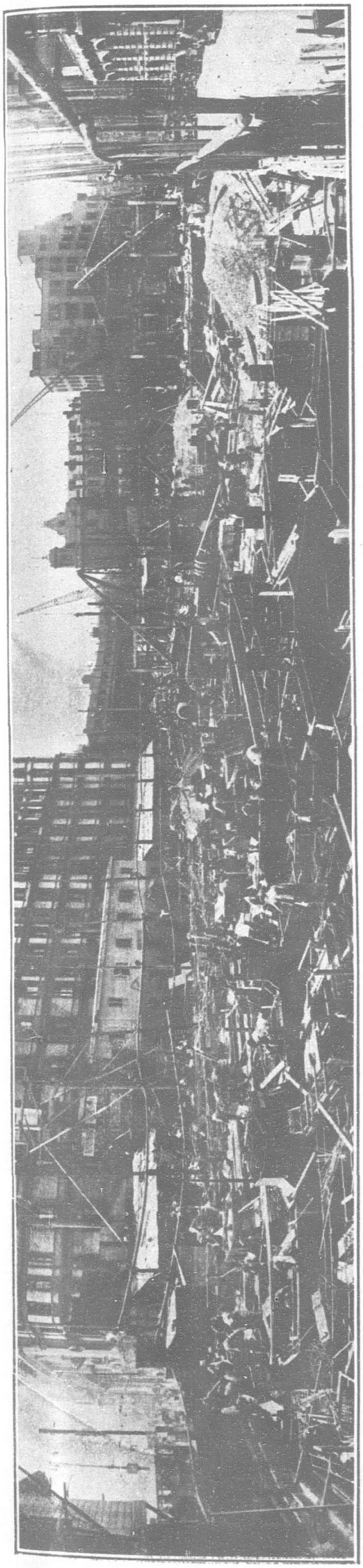
Contractor for main Building, Sin Jin Kee; Raymond Composite Patent Pile, Hongkong Excavation and Pile Construction Co.; Dampproofing, Andersen, Meyer & Co.; Electric Wiring, Inniss & Riddle, Ltd.; Expanded Metal, Truscon Steel Co.; Glass, Pilkingtons Ltd.; Heating, Plumbing & Fire Installation, Shanghai Waterworks Fittings Department Co.; Doors, Frames and Architraves, China woodworking & Dry Kiln Co., Ltd.; Floors and General Joinery, G. W. Mc'Bain & Co.; Lifts, Otis Elevator Co.; Structural Steelwork, Dorman Long & Co.; Steel Windows, Crittall Mfg., Co.; Boilers, Ruskin & Hornsby Co., Ltd.; Granite, S. V. Chen Kee; Sanitary Fittings, Doulton and Company; Lift fronts, W. S. Tyler & Co.; Boilers, Rustson and Hornsby.

The Shahmoon Building

Next in size and importance to the Sassoon House among the downtown office buildings, is the Shahmoon



Piling Work on New Customs House



On the Job at the Sassoon House

Building being erected at the corner of Museum and Soochow Roads for S.E. Shahmoon and Company by C.H. Gonda, the architect. This building is to be 102 feet high and will cost Taels 600,000, or about Mex. $900,000. It will be completed next month.

This New Building is situated on corner of Museum and Soochow Roads, a location made prominent in view of the new bridge, making Soochow Road one of the busiest thoroughfares in the city. Considering the excellent site and the fact that Shanghai still was lacking an up-to-date downtown Theatre, the owners of the Shahmoon Building decided to erect a modern theatre building.

The new construction comprises a Theatre adopted to stage plays as well as for cinematographic expositions and five floors of offices and apartments on top. This is the first time in local building history, that a theatre is overbuilt by offices or apartments, proving that Shanghai in every respect is keeping pace with modern construction methods abroad. On the roof are the fan rooms, containing the mechanical equipment of the air conditioning and cooling plant. A further novelty is the film vault on the roof, comprising six units for the purpose of storing films. This is the first film storage plant constructed in accordance with the best practice of fire-proof construction, in Shanghai.

The new playhouse promises to be outstanding in local theatre construction, as it is equipped with all up-to-date mechanical devices till now only found in the foremost theatres of Europe, America and Tokyo. The theatre will seat about one thousand on the ground floor and the balcony. The entire decoration scheme will be conservative, comfort and safety of the patrons have been made the principal feature in the design, of this theatre. Besides an up-to-date heating and lighting system, the Building will be the first in Shanghai to boast a scientific mechanical ventilating system and a cooling plant. The cooling plant will provide a temperature in the Auditorium much lower than outside.

Lounge rooms, bars and ample cloak rooms will add to the comfort of the theatre goers. Comfort, safety from fire hazards and panic, are the keynotes of this design.

Unusual constructional problems have been solved by the architect, Mr. Gonda, to provide an Auditorium without any columns, notwithstanding the fact that the theatre has to carry five floors of offices and apartments on top. The construction of this building is of reinforced-concrete with beams of exceptional spans, which heretofore have not been used in local building construction. The entire building is fully fire-proofed, equipped with steel windows and all modern mechanical devices, and has been designed in such a way as to have the theatre part entirely separate from that containing offices and apartments.

It can be noted from the sketch reproduced here that the designing architect, who in the Sun Sun Building has achieved a unique design, offers a different style from others in the city. The architect emphasizes not by superfluous ornaments taken from a bygone building period, but through simplicity in expressing constructional facts. This style can be taken as an expression of modern technical achievements, giving a new form and a new expression to new building materials and new ways of construction.

Contractors

General Building, Contractors, Chang Yue Tai; Heating, Plumbing, Sanitation, Ventilation, Cooling, Fire Protection, and Artesian well, Gordon & Co., Ltd.; Electric Light Installation, Larsen and Trock; Ray Burners, Langdon & Co., Inc.; Roofing and Tiling, Andersen, Meyer & Co., Ltd.; Steel Windows, Crittall Manufacturing Co.; Linoleum Flooring, Andersen, Meyer & Co., Ltd; Carpets & Curtains, H. Peppercorn; Theatre Chairs, Tai Chong Co.; Fire-proof Theatre Curtain, Andersen, Meyer & Co., Ltd. Lifts, Otis Elevator.

The Y.M.C.A. Building

Jumping from the Bund to the increasingly valuable district that lies along the Race Course on Bubbling Well Road, where a whole row of tall building are to go up, there is the new large Y.M.C.A. central building for Shanghai, immediately adjacent to the recently completed China United Assurance Society Apartments. This splendid nine-story structure, the last of a series of Y.M.C.A. centers to be constructed by the 'Y' building Bureau in China, of which Mr. A. Q. Adamson is the director, is to be completed in March.

It is on a site, 190 feet by 128 feet, or approximately three mow, and is going up in two sections, the main full-height buildings and a gymnasium and swimming pool of four stories in the rear. The material is reinforced concrete, throughout, the only structural steel going into the gymnasium, while solid steel is being put into the heavy columns shown in the perspective.

The main lobby in this building on the second floor will be one of its most attractive features, with dimensions of 40 feet by 100 feet. On the ground floor will be the entrance from Bubbling Well Road, the barber shop, bowiling alley and other facilities, while the lobby occupies the floor above, with a mezzanine for offices, the social halls and reading room impinging off the lobby. On the third floor are the dining room, library, and kitchen while all floors above will be occupied with rooms providing for 253 guests.

The face-brick of a buff color is one of the outstanding features of this central "Y", the first piles for which were driven over a year ago, Oregon pines, some as long as 80 feet, being used exclusively. The total cost of the building is Taels 648,000, a cost per cubic foot of 45 Tael cents. The face-brick is being furnished by the Taishan Brick and Tile Company, Anderson, Meyer and Company served as consulting engineers, while Mr. Elliott Hazzard assisted Mr. Adamson as consulting architect.

The contractors follow:

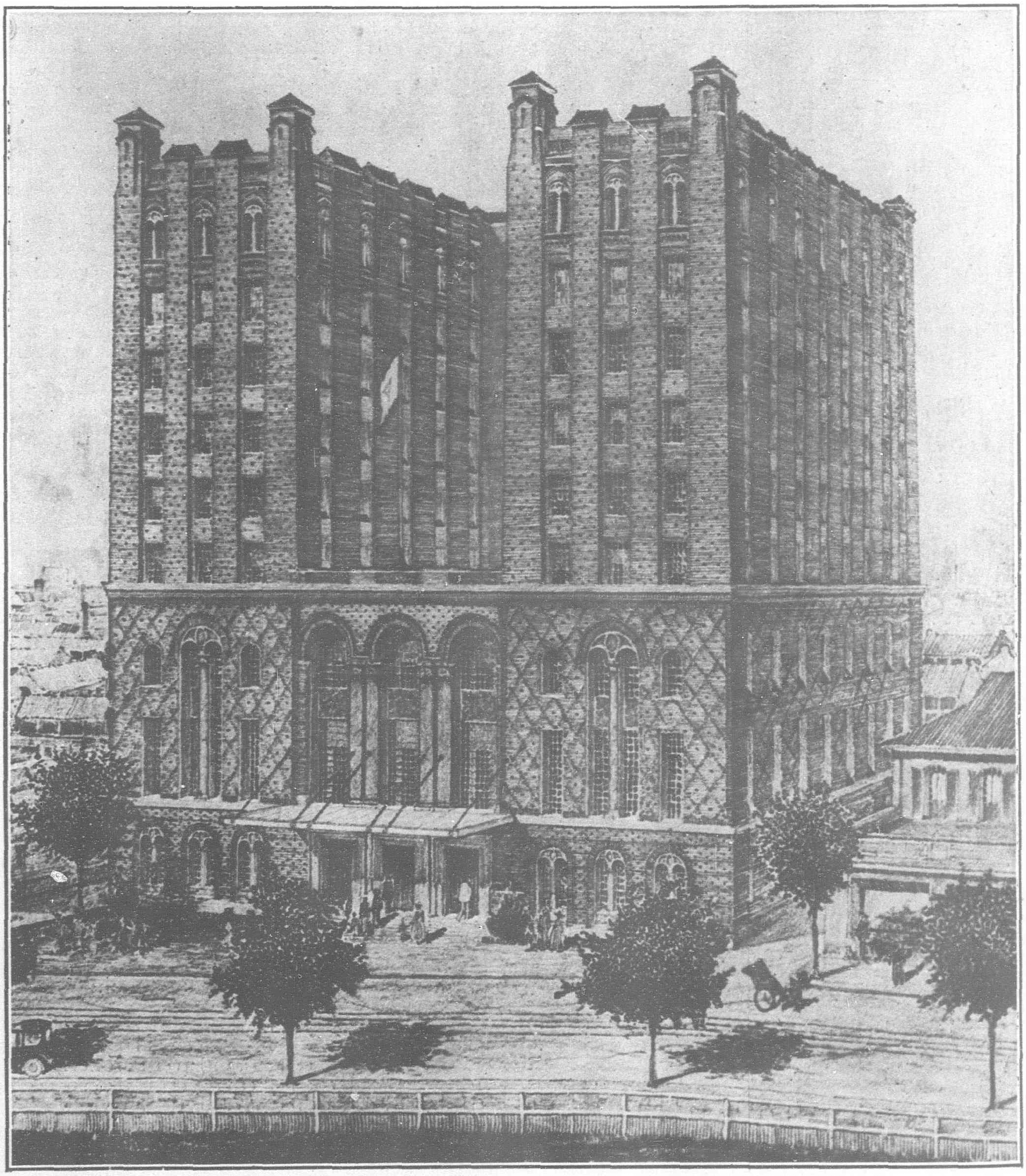
General contract, Whay Ching Kee; piling, Sin Jin Kee.
Heating and plumbing, Gordon and Company

Electric wiring,	Anderson, Meyer
Hardware	Corbin
Steel sashes,	Truscon
Elevators (3)	Otis Elevator Company

The Bank of East Asia, Limited

This building is situated on corner of Kiukiang and Szechuen Roads on Cad. Lot. 89-B Central District. The building will be occupied on the ground floor by the Bank of East Asia, Ltd., while five floors of up-to-date offices with all modern conveniences will be above. The top floor is converted into living quarters for the Manager of the Bank and the Managing Director. The flat roof is developed into a spacious roof-garden with a luxurious pavillion.

On the ground floor at the corner of Szechuen and Kiukiang Roads is the imposing main-entrance to the Banking Hall leading through a marble-lined vestibule; from this vestibule there is a direct entrance to the spacious teak-wood panelled Manager's room, while through an arch of marble columns, the entrance to the client's space is leading. A feature of the Banking Hall is the entire *absence* of any column, though there is a span of 48 feet from wall to wall and in addition to it six floors of offices are resting on top of it. A marble counter is separating the client's space from the staff's working place. Three big vaults, the Bank's safe, the safe deposit vault and the book vault are located on the ground floor, while a large vault is situated in the basement. The two office Entrances, one on Kiukiang Road and one on Szechuen Road each containing a spacious and up-to-date Elevator, are giving easy access to the offices.



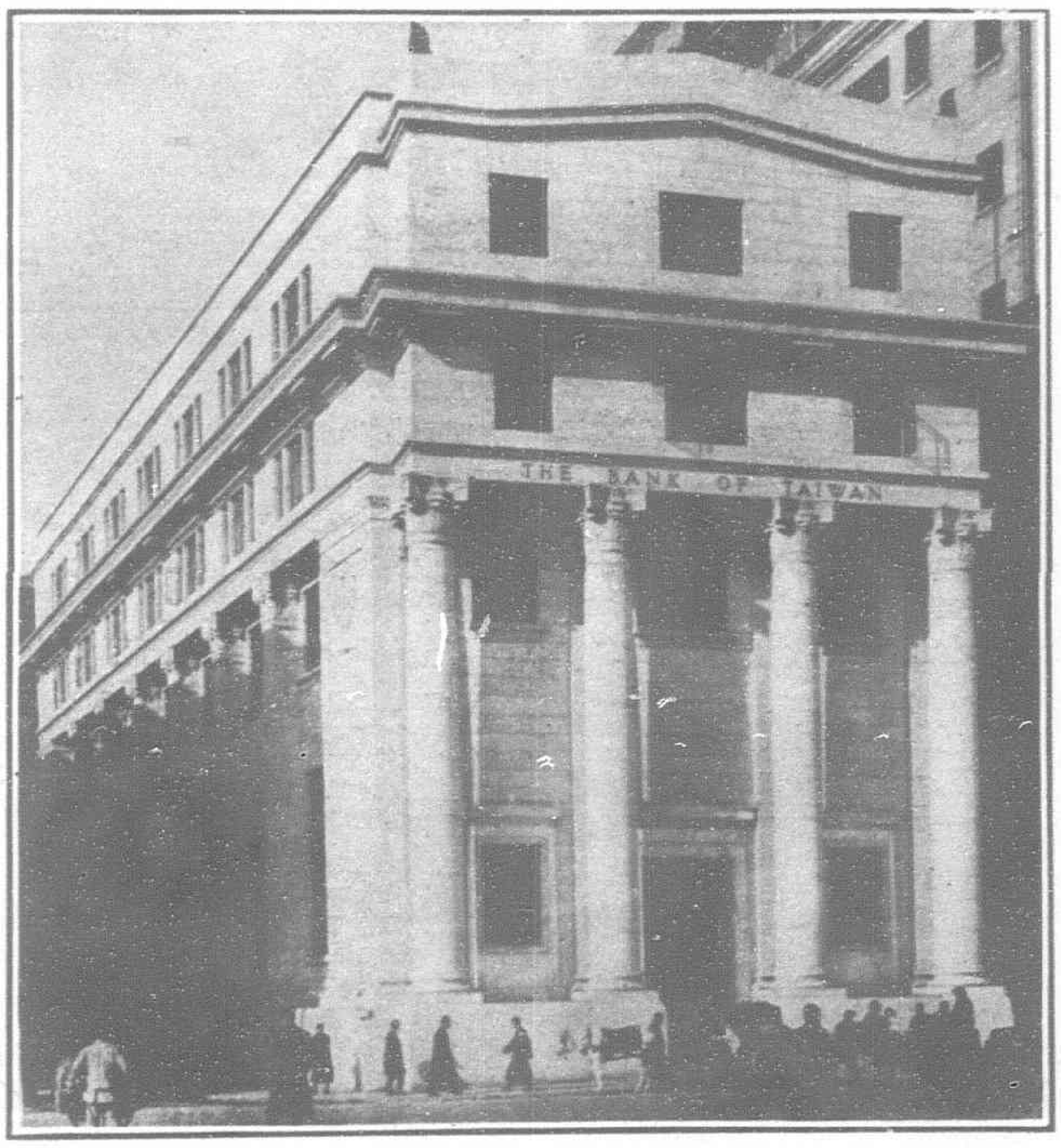
Foreign Young Men's Christian Association, Shanghai, China

The entire building is of a reinforced-concrete frame construction with brick filling walls, all partition walls are either solid reinforced-concrete, or metal lath and plaster. All materials used have been carefully selected for the purpose of securing the building as entirely fire-proof. All modern mechanical devices have been introduced into this building which will be equipped with the most modern electrical installation, central heating, fire protection, steel windows and passenger elevators.

The building being of a narrow shape but exceptionally high (105 feet) has made it necessary to give particular thought to the foundations which consist of a reinforced concrete raft resting on wooden piles, protecting in this way the building from any unequal settlement.

It was the intention of the architect, Mr. C. H. Gonda, to achieve a design adopted specially for this purpose and emphasizing particularly the modern way of construction. It was further the intention to emphasize in the outside appearance clearly the purpose for which the different parts of the building are constructed, as can be seen from the accompanying sketch of the architect. The two cornices are dividing the building into the three parts according to uses, that is, the ground floor for Banking purposes, the second part for offices and the third part for living quarters. It may be seen from the picture, that the architect, Mr. Gonda, has omitted the conventional design of big classical columns, which are so untrue in the constructional way and fit so little for the purpose of the building. As in modern buildings the walls only constitute the filling material, as the weight of the building is carried by the reinforced-concrete frame, it is possible and naturally most advisable for the purpose of obtaining the maximum of day light and ventilation to, dispose the walls into windows emphasizing only the carrying columns. This style of architecture, though being new to Shanghai, constitutes an example of modern architecture, where the outside appearance corresponds entirely with the essential parts of construction, where no superfluous conventional ornaments borrowed from periods, constructing with different materials, hide the more progressive forms of methods.

It appears from a recently completed building, of Mr. Gonda, the Sun Sun Department Store, that this architect is achieving in his designs satisfactory results by going an individual way.



Bank of Taiwan
Designed by Lester, Johnson and Morris

Contractors

General Building Contractors, Yah Hsing & Co.; Plumbing, Heating, Sanitation and Fire Protection, Wha Whing Co.; Steel Windows, Andersen, Meyer & Co., Limited.; Safe Doors, Vault Work, Mosler Safe Co.; Electric Light Installation, Larsen & Trock; Marble Work, Finocchiaro & Co.; Roofing, P. Fagan & Co., Lift, Otis 2.

The Joint Savings Society Building

The Joint Savings Society of the Yienyieh Kincheng Continental and China & South Sea Banks is erecting a building for its head office on the corner of Szechuen and Hankow Roads.—

The building which has been started recently, will be completed by the end of this year. It will be one of the most unique buildings in the business section of the town.

Although very simple in design, the building impresses mostly with the beauty of the true materials selected for facing the elevation.

The elevation is faced up to 45 feet with white Carrare marble showing the peculiar classical touch in the treatment of the columns, cornices and ornamentations.

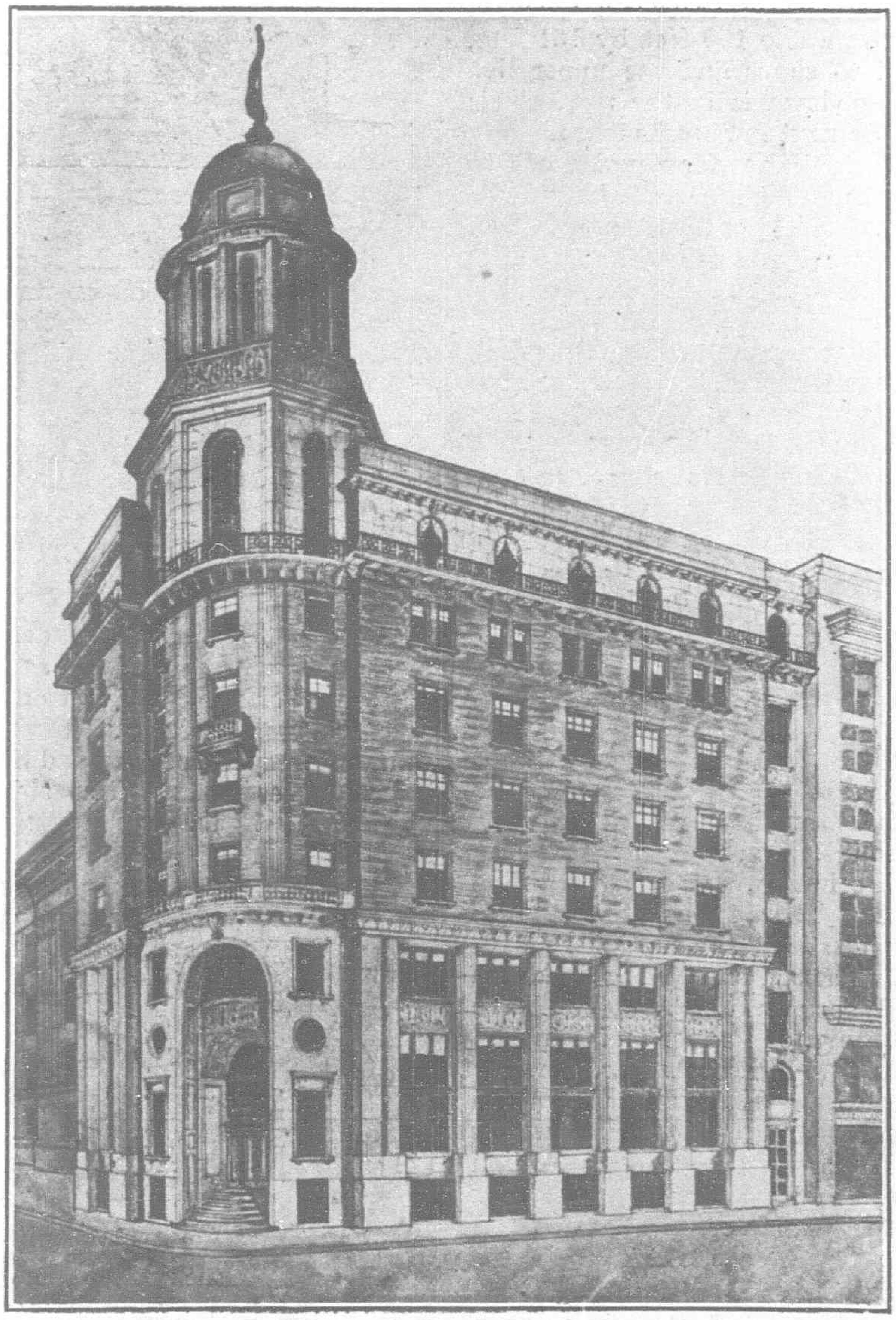
The main entrance of the Savings Society is located at the inter section of the two roads. It is an immense marble archway which is closed by a heavy bronze chaincurtain. The rest of the facade, with the exception of the topmost story, is faced with a deep red and brown tapestry brick, marking a pleasent contrast with the shining white marble of the lower stories.

The topmost stories and the cupola are treated in white stone.

The lower three stories are occupied by the offices of the Savings Society. The main banking hall is on the elevated ground floor together with the safe deposit department, which contains 1,000 deposit boxes.

The banking hall is treated with marble wallfacings, marble counters and columns in delicate tones and subdued simple designs, so that the effect is based on the beauty of the genuine materials employed in the decoration, and in the fine proportions of the room itself.

The mezzanine is occupied by the book-keeping department to which are attached the vaults for bank securities and various bookvaults.



Proposed New Building of the Joint Savings Society of the Yienyieh Kincheng Continental China and South Sea Banks, Shanghai

The next story is taken up by the president's, secretary's and general offices and the bank note-issue vaults.—

The joint treasury is located in the semi-basement which is reached from the marble vestibule of the side-entrance on the Szechuen road. This entrance also serves as a secondary entrance to the banking hall, elevator-lobby and the various offices located in the upper stories.—To the joint treasury are attached special money cashing rooms and a sycee vault equipped with elevators and a sycee box transporting system.—

The topmost story which is placed on the roof not noticeable from below, occupies the clubrooms for the employes of the Joint Savings Society and Treasury. The club consists of a large lounge facing the roof terrace and pergola, various dining rooms, etc.—

The architect of the building who has been selected on a closed competition is Mr. L. E. Hudec, B. A., who designed the Country Hospital.

The contractors for the Joint Savings Society Building are:

General Contractors, Kung Yih and Company; Elevators, Otis; Safe door and Safety Deposit Equipment, Mosler Safe Company; Exterior marble, Tankai; Interior Marble, Finochian Sashes, Truscon Steel; Electric wiring, Andersen, Meyer; Heating, Samson Houghty and Co.

Other Buildings

Three more large buildings are going up in the downtown district, an office building on Museum Road next to the Shahmoon Building, another in the next block on Yuen Ming-yuen Road, and a synagogue on Museum Road. The building programs, in fact, seem concentrated in this neighborhood. Both the office buildings are of seven stories and both are being built by the firm of architects, Morehead, Halse and Robinson, the first for the Shanghai Land Investment Company and the other for B.A. Somekh.

The Museum Road building is on a site 100 feet by 151 feet, the two lower floors being devoted to shops and the upper five to apartments and offices, while a godown is in the rear. This building is to be completed within the next few weeks and already has been leased by the Shanghai Defense Force for a period of two years. It is to be 87 feet in height and is being completed in the record time (for Shanghai) of ten months. The cost is Mex. $275,000. The general contractor is Kung Yik and Company, the two lifts being furnished by Smith, Major and Stevens, and the steel casement windows by Crittall and Company.

The Yuen Ming-yuen Road building is on much the same model, with a godown in the rear, five floors of offices and two of apartments and rooms. The main building is on a site 54 feet by 80 feet and the godown 49 by 80. The height overall is 85 feet. It is being built of reinforced concrete with a stone face and is to be completed by the end of the year. The passenger lift is by the Otis Elevator Company, and the cargo by the General Electric. Nein Tai and Company is the general contractor. The cost of this building is Mex. $225,000.

The New Synagogue

In the case of the synagogue, Palmer and Turner, architects, have had some unusual problems to deal with. The building is elliptical in shape, on a site 80 feet by 52 feet. It has brick walls and a steel framework roof, the height over-all being 75 feet. On the ground level are reading rooms, lecture halls, meeting rooms and the boiler house, while the main auditorium is up one flight.

The entrance to this huge auditorium, which is 36 feet from the floor to the roof, is by a staircase. There is the usual arc and raised platform, in this case in the West end, and a gallery two-thirds the distance round the hall. The central reading desk is in the center of the hall. Messrs. G. L. Wilson and E. F. Bothwell have been directing operations in this building for Palmer and Turner.

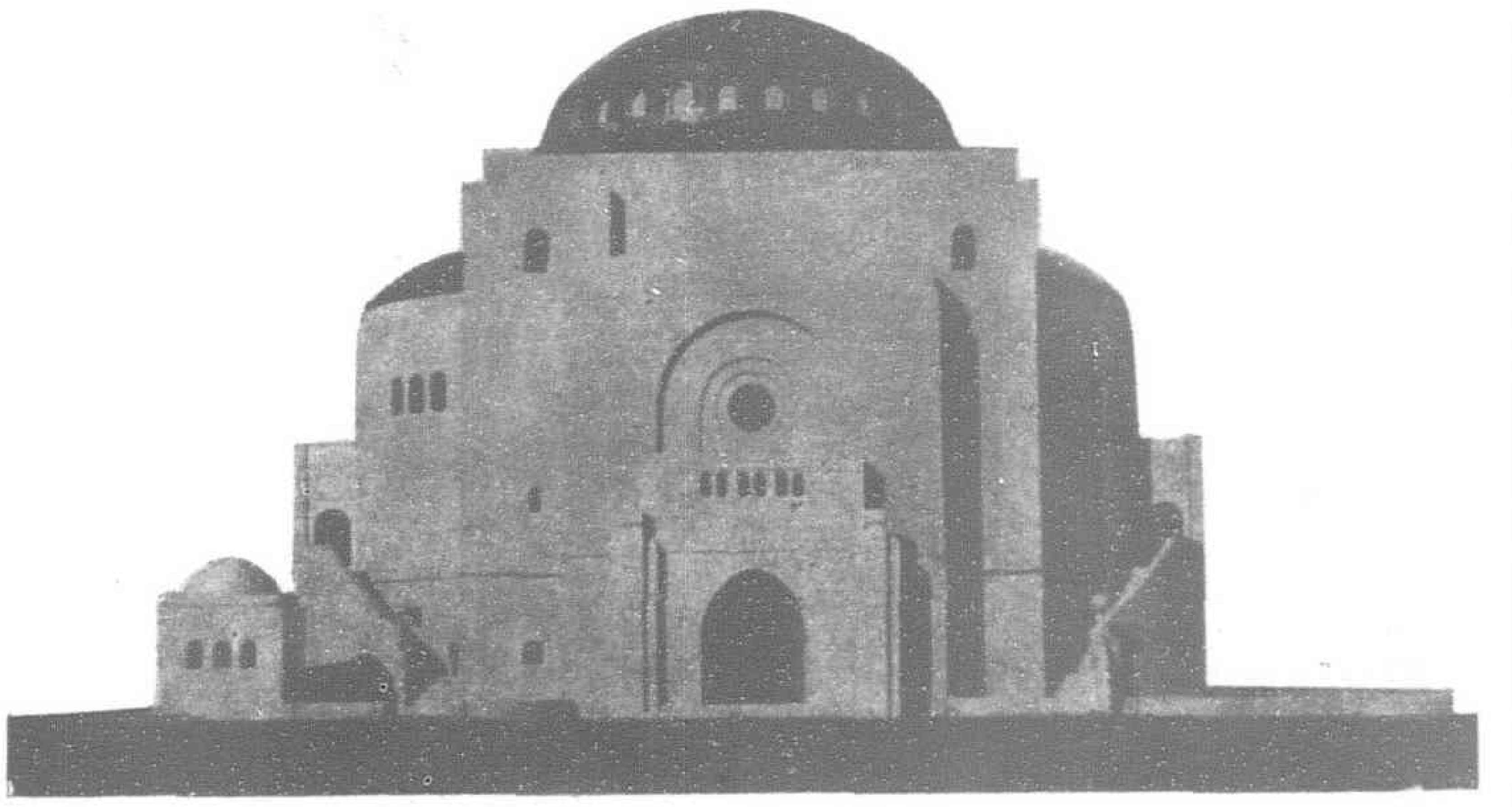
The Synagogue is the gift of Mr. and Mrs. S. A. Hardoon.

The general contractor was Fong Saey Kee, while the others are: New Engineering, Steelwork; H. C. Wessels, Electric wiring and fittings; Gibb, Livingston, Plaster-domed ceiling; Kailan Mining Administration, Bricks; Shanghai Waterworks, Sanitary heating and fire protection system; A. Malcolm (Luxfer Co.), Steel casements, and leaded lights; Wm. Jacks, Hardware; Arts & Crafts, Screen; Tai Chong, Seating; Sing Tai Furnishing Company, Panelling.

While all the main downtown buildings have been described in some detail, building in other parts of Shanghai has been progressing on a like scale. Apartment houses are being put up in astonishing numbers in various parts of the city, particularly in the French Concession. Conspicuous among other new buildings might be mentioned a thirteen-story building directly opposite the Cercle Sportif Francais, the work of Palmer and Turner, a seven-story building at Boone and Chapoo Roads, overlooking Hongkew Park, by Moorehead, Halse and Robinson, a church at the corner of Hankow and Szechuen Roads by L. E. Hudec, and scores of other buildings of like dimensions.

Of those that are planned in the central district, the N.Y.K. on the Bund and the China Press building are the largest. This latter is to replace the old Shepherd's Hotel at the corner of Kiukiang and Szechuen Roads, a building which already has been torn down and the land given to the troops for recreation huts. At this point, too, Szechuen Road has been widened, just as Nanking Road was widened when the Sassoon House was planned. The China Press building is to be of height-limit and in the shape of a L, on two sides of the recently constructed Benjamin Building.

It will be noted that, in both the China Press and the Sassoon structures improvements were made in the street planning, consequent upon the new policy of the Municipal Council to remodel the city wherever possible in the congested districts. It has been the dream of many of the leading members of the community to improve Nanking Road on its entire stretch as it has been built up within a few blocks from the Bund. At present, the appearance of this main thoroughfare from Honan to Thibet Roads, with the exception of the Wing On and Sun Sun department stores is far from prepossessing, but the plans for a greater Shanghai comprehend a widespread development along this "Fifth Avenue," as well as sweeping changes on the outskirts of the Settlement, in the traffic arrangements downtown and the reformation of many of the poorer districts to the East.



Shanghai's New Jewish Synagogue

Greater Shanghai will be a modern Occidental city. Its population is increasing already at the rate of four per cent. on the present two millions each year. It is a city whose importance is increasing politically as well as commercially and during the recent upheaval Peking dwindled to a museum-like residential city, while Shanghai leaped ahead as the real capital of China. Another ten years of prosperous trade and Shanghai will be the most important industrial, commercial and shipping center in the Far East, its operations will be comparable with most of the large capitals of the west, and its buildings, its appearance, will have changed from the Levantine atmosphere that is the resultof the alchemy of East and West intermingling, to a towering citadel of skyscrapers—a Manhattan transplanted to the Orient.

North Manchuria's Wealth

Statistics compiled by the Manchurian Research Society of Harbin show that the wealth of North Manchuria compares favorably with that of the rest of China. The statistics show:

	Imports Per Capita of Population in Taels		Exports Per Capita of Population in Taels	
Year	N. Manchuria	China Proper	N. Manchuria	China Proper
1913 ..	3.34	1.20	3.38	0.80
1923 ..	5.49	1.90	8.90	1.32
1924 ..	5.72	2.11	9.45	1.34

"On The Air" In China

Vast potential radio market now on plane with Smuggling—hinges upon attitude of Nationalist Governments

By James Hoeck

OFFICIALLY there is no broadcasting in China. Thanks to a stupid governmental embargo on radio apparatus, the legitimate business of importing receiving sets into China is on a par with boot-legging and gun-running. And yet, despite this violation of the "Open Door" agreement, the radio business, like several other contraband trades in this land of turmoil and paradox, thrives and grows.

Through the back door, and by every conceivable surreptitious entry, no less than 10,000 radio sets have been imported into China during the past three years, and there are five broadcasting stations in Shanghai, one in Tientsin and two in Manchuria, all operating with a fair degree of regularity, and constantly stimulating the demand for radio apparatus.

This surface progress in the radio business, however, is far from indicative of the state of the unique market presented here. The growth has been achieved in the face of such besetting difficulties and with such spasms as to threaten the extinction of the business at one time or another, and had it not been for the enterprise of the Japanese, the tenacity of a few Americans and the interest of a group of foreign and Chinese educators and social service workers, there is no doubt that there would be little or no market at all, under present conditions.

That the market does somehow exist and that receiving sets can be sold and broadcasting carried on free of any restrictions, indeed, are the only encouraging factors in sizing up the situation, but the pitiful lack of organizations through which the same business has suffered in other countries and which is lavishly in evidence in China, has created handicaps that render it a most precarious trade.

"Little Miss Shanghai"
Miss Ai-lien Wu

With such a relatively small field, circumscribed as it is by wars and the embargo, and with no provision made for government support, broadcasting, obviously, is not in the least profitable. It is carried on only as a means of advertising the radio business itself, or else purely, as in Manchuria, through a too-stringent governmental supervision. Manchuria, in fact, may be considered as a field distinct from the rest of China, for here only has it met with official recognition, and that within the past year.

Shanghai the Center

Shanghai is the real capital of the radio business, as a business, for here are located, not only the central agencies for the largest foreign firms engaged in the trade, but the five stations which can be heard in the surrounding territory, and one of which can reach the entire Far East. These five stations function on regular daily fourteen-hour schedules, on slightly different wave lengths, and in some cases the programs are on a par with many that are produced in America, although 75 per cent. of the broadcasting is done in Chinese.

Over the Kellogg Switchboard and Supply Company station of 250 watts, known as KRC, is carried the heaviest program of all, no less than nine schedules of a total of nearly six hours going on the air daily. Into the microphone in the richly fitted studio on Nanking Road, all the leading artists in Shanghai, both foreign and Chinese, have played their repertoires. News and stock quotations in both Chinese and English, the entertainment program of the China Press, and KRC's own broadcasting programs go out of this station from 9.30 o'clock in the morning until after 11 o'clock at night, closing with the Chinese equivalent of bed-time stories, this art of story-telling being a favorite with the Chinese, who own 50 per cent. of the sets in this locality.

Most popular and useful of all is broadcasting among residents of the so-called outport cities, such as Hankow, Nanking, Wuhu, Foochow and scores of other places where mails are slow and often there is no railway.

Banks and other business institutions in these remote centers rely upon the daily quotations entirely, and "Little Miss Shanghai," Miss Ai-lien Wu, has become famous through her conduct of the programs. When the announcer in the Kellogg studio in Nanking Road speaks into the carbon disc, he is heard by as cosmopolitan an audience, both in the city of Shanghai, in the wilds of the interior of China, in Japan, the Philippines and by ships in the Pacific, as it is possible to have anywhere in the world within a radius of a few thousand miles. And conversely, when one is "listening-in" with a receiving set in Shanghai, the air is almost as poly-linguistic. One hears, not only the five stations in Shanghai, in three languages, but Dairen, Manila, Vladivostok, and Tokyo.

American Supplies Preferred

Of the four other stations in Shanghai, one is British, under the management of Fred Kempton of the Radio Supply Company, on Yu Yuen Road, a five-watt set of RSC call—two are Japanese, one the 50-watt Kobe Electric Company's apparatus, NKK and the other of the same power operated by the Mainichi Shimbun, KSMS, and the fifth is purely Chinese, owned and operated by the Sun-Sun Department Store on Nanking Road, a counterpart of the famous studio operated by Gimbel Brothers in New York. These operate on wave lengths varying from 229 on RSC, to 350 on KRC. The programs are of much the same variety, music and stock quotations in Japanese and Chinese constituting the bulk of the out put.

It is through the firms operating these five stations that most of the radio apparatus sold in China is distributed. The Kellogg Switchboard and Supply Company, of which Roy DeLay is general manager, is also agent for the following manufacturers:

Reliable Electric Company, Chicago
Jewell Electrical Instrument Company, Chicago
Van Horne Tube Company, Franklin, Ohio
French Battery and Carbon Company, Madison, Wisconsin.
Acme Apparatus Company, Cambridge, Massachussetts.
Foote Radio Corporation, Philadelphia
Electric Specialty Company, Stamford, Connecticut
Wireless Specialty Company, Boston,

Ward and Goldstone, Manchester, England.

Mr. DeLay estimates that 90 per cent. of all apparatus sold in China is of American origin. In addition to the large agency maintained by the Kellogg company, there is the Electric Service Corporation, a separate establishment likewise headed by Mr. DeLay, which serves as agent for the Radio Corporation of America, the Crosley Radio Company, the Willard Battery Company, the National Carbon Company, and others. The Chinese seem to prefer American apparatus of every description because of its lower price.

Of the other agencies, only one or two are devoted exclusively to radio, the Radio Supply Company representing several British firms, including:

S. G. Brown, Ltd., London.
Towers Manufacturing Company, Boston.
General Lead Battery Company, Newark.
Portable Utility Company, Ltd., London.
Benjamin-Hughes Electric Company, Montreal; Interstate Electric, St. Louis.

The General Electric Company of China, another British Company, also has a radio department, while Siemenss and Company a large importing concern in Shanghai, represents the German Telefunken products. Marconi maintains a small agency in Shanghai, both the latter and Telefunken engaging primarily in commercial wireless outfitting.

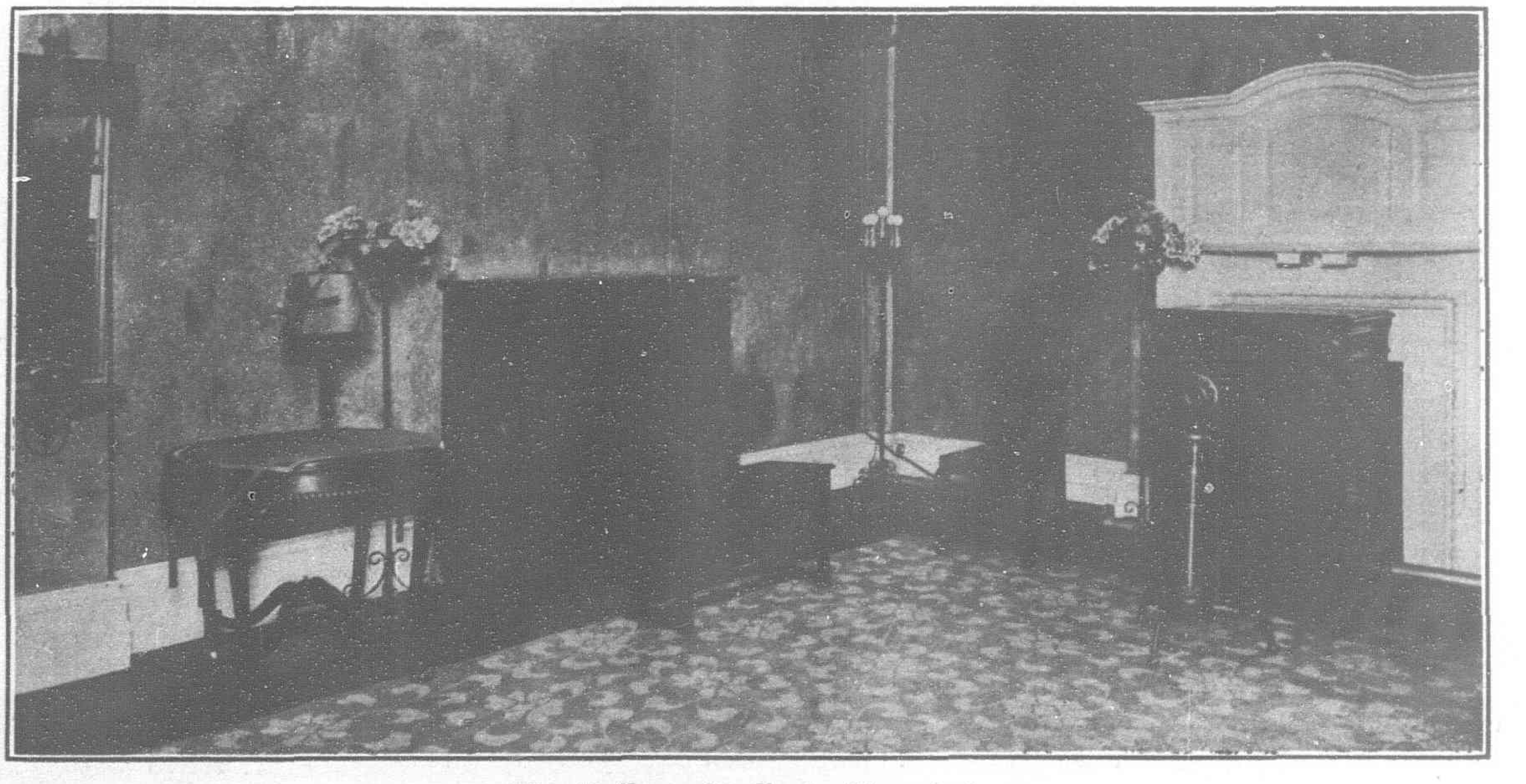
As for the sales of apparatus of local manufacture, no company in Shanghai, either Chinese or foreign, has succeeded in establishing a satisfactory business, due to the slack demand. The Japanese company engaged in broadcasting is agent for several Japanese manufacturers and carries on an extensive retail trade in certain districts, but none of them are devoted exclusively to radio, with the exception of the Electric Service Corporation, the principal business even of the Kellogg firm being in telephones and other electric equipment.

Owing to the absolute embargo on apparatus in the port of Shanghai it is impossible to give an accurate estimate of the amount of business done. The radio sets never pass through the customs, the authorities adopting the attitude of "Try and get it in; if you do we can't stop you." And so some of the apparatus comes in through Shanghai, sub rosa, while at other ports, where it seems to be more or less optional, it is brought in with absolute freedom.

Broadcasting in Manchuria

In Manchuria where radio broadcasting has enjoyed official sanction, the business, paradoxically enough, is at a very low ebb. This is partly due to the conditions imposed by the Government on dealers in apparatus. To import radio sets into Manchuria, in the first place, the agent must pay Mex. $1,000 for his license, constituting a bond for the privilege of doing business. The next requisite is that he must obtain a special permit for each shipment and pay a tax of ten percent of the wholesale value of the apparatus to be imported. This tax is over and above all Chinese duties and surtaxes, and brings the total tax on radio to 17½ per cent.

The income derived from this special tax belongs to the Radio Administration of the Manchurian government, and is devoted to the installation of Government broadcasting stations, as is also the fee of $1 which each person purchasing a set must pay to the Radio Bureau. This, however, is only a registration fee, and the owner of a set must in addition pay a license fee of $6.00 a year for the privilege of having a crystal set, and $12.00 a year for a tube set of any size.


The Kellogg Studio in Shanghai

These regulations went into effect on September 1, 1926, and about the same time two broadcasting stations were installed by the Government, one at Harbin, replacing a set that had been operated by a French Company, and the other at Mukden. Both are of one kilowatt, that in Harbin having been installed by the Kellogg Switchboard and Supply Company.

Not more than 1,000 subscribers in all of Manchuria thus far have supported the stations. The system, modeled on that adopted in Great Britain and Japan, has had comparatively little popular appeal, but daily programs are being sent out and the interest in North China may be said to be slowly awakening. In this section of China, too, the slow tempo of progress, is also partly due to the fact that there are only a few small agencies of Japanese firms engaged in the trade. No educational campaigns have been carried on and the programs have not been of sufficiently high caliber to attract large numbers of potential subscribers from the rich country districts.

It was out of the radio development in Manchuria that one of the strangest situations in the history of the trade developed. In Tientsin, which is nominally under the control of the Peking government, under whose regulations the embargo went into effect, a broadcasting station has been erected, converted from an old wireless set used by the Bureau of Communications, and this station operates under Manchurian regulations. But the Commissioner of Customs at Tientsin does not recognize permits on shipments of apparatus granted by the Radio Bureau at Mukden and any apparatus sent to Tientsin must be forwarded by rail to avoid the customs. It could only happen in China!

In glancing over the entire field, Manchuria and south China included, it is obvious that the progress of radio in China has been of a comparatively limited nature. The possibilities of the market are shown by the steady growth since the introduction of the first large station only three years ago, but it is evident that the expansion, even when the embargo is lifted, will not be nearly as spontaneous as it was in Japan, where 300,000 sets were sold in the first few months after the "lifting of the lid" under Government supervision.

The Chinese never have been as receptive to inventions as the Japanese, and, as a further deterrent to heavy sales, the purchasing power of China by and large is too low. The centralization of wealth, vested in roughly a million of the 400 millions, makes an unusually wide market for the costliest sets, and a huge market for the cheapest grade with the small merchant, the clerk and the student, for the middle class that buys the most in England and America does not exist here. It is either a Rolls-Royce or a Ford with the Chinese!

The lethargy of the Chinese buying public with respect to radio, accentuated by the impossibility of distribution to some of the principal markets of the interior by war-time conditions, in fact, is nothing compared to what it might be, had there not been a systematic, nation-wide educational program in the earliest days of radio in China. And herein lies perhaps the most unusual chapter in radio development here.

It was in the latter part of 1911 and early in 1912, with the sweep of the anti-Manchu revolution, that radio first secured its foothold here, not so many years behind the Western world. Sponsored by the National Y.M.C.A., a group of experts set out on a "chatauqua" lecture tour of China, demonstrating apparatus then of the most up-to-date type and delivering talks of a non-technical nature at all the leading colleges, scientific schools and universities in the country. This group of pioneers included Dr. John Y. Lee of the research department of the Y.M.C.A., Dr. Roberston, and others.

For some years these periodical lectures were made on an increasingly intensive scale and the interest thus aroused gradually mounted to a crescendo of enthusiasm for the importation and use of radio in young, republican China. It was three years ago that this campaign was discontinued due to the constantly disturbed state of affairs, but its work had been done and it had left a solid impression.

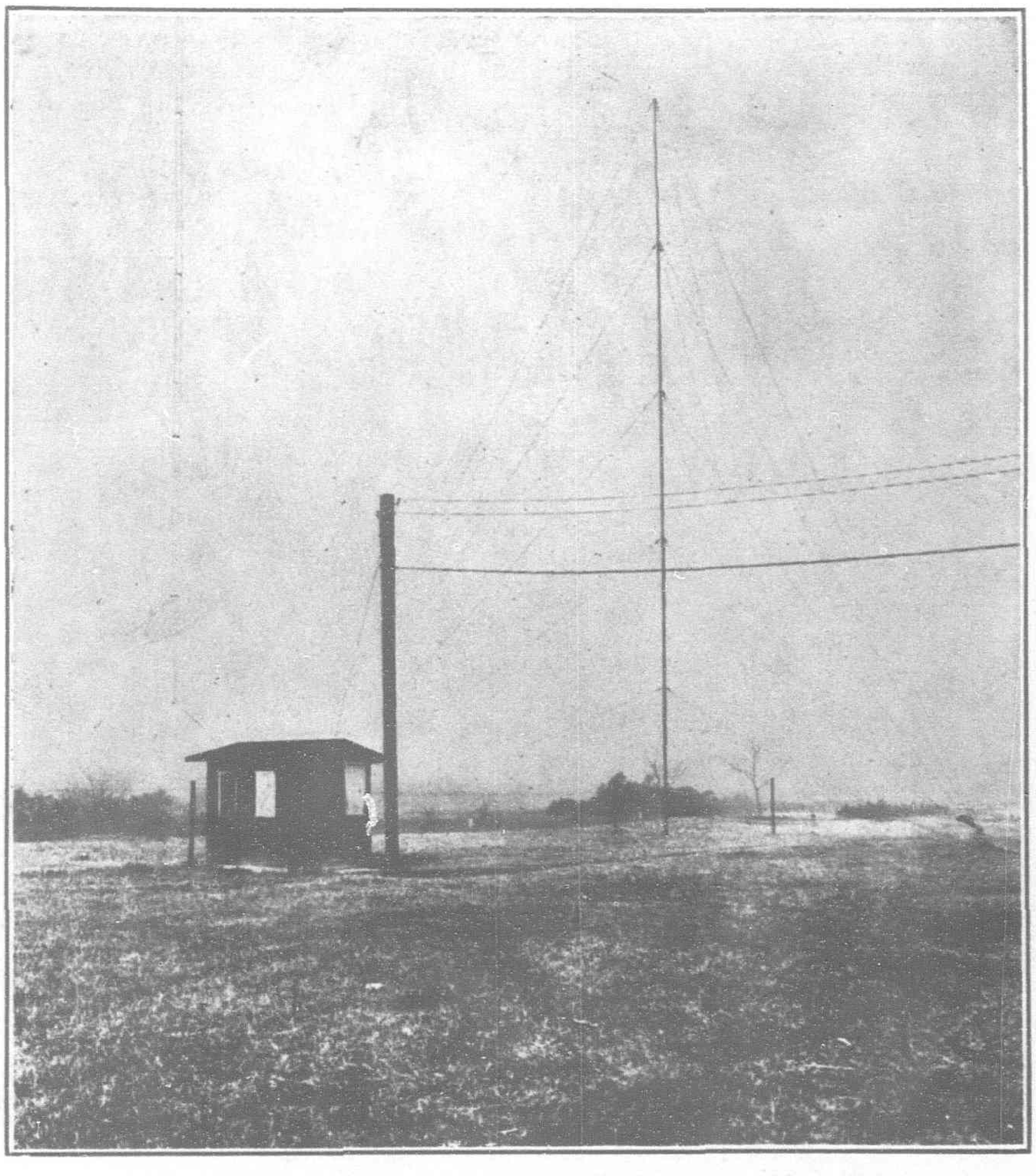
Chinese armies began using radio apparatus with the help of foreign experts. The Bureau of Communication of the Government at Peking installed sets at various important centers, notably a large station at Hankow and another near Shanghai at Woosung, to supplement the transmission of telegrams. A course in radio instruction, the first and only one of its kind, was added to the curriculum of Nanyang University, near Shanghai, where many of the employes of the telegraph service are trained.

It was during the last decade also that the three conflicting concessions to foreign companies for the installation of stations for international communication were granted. This, of course, developed into the triangular warfare between the Federal Company of America, the Marconi Company and the Mitsui interests, with a French firm likewise claiming its share. Although one station has been erected and another started under these contracts, the result of the battle has been a stalemate for the fond program to link China with the rest of the world by radio and the issue will probably not be settled for some years to come. The only tangible result of all these negotiations has been the embargo on radio equipment.

Meanwhile, the uses of radio for internal communication progressed. Encouraged by the educational program, the growth of amateur wireless work and the general increase of foreign trade, an experimental broadcasting station was opened four years ago by Harold Osborne, an American radio expert, in the Dollar Building. A. C. Davis of the Electric Equipment Company, was next to start broadcasting, and these two labored for some time to establish permanent stations unrewarded. Finally in 1924, the Kellogg Switchboard and Supply Company went into the field with its present powerful station and has been operating continuously ever since. Its success in stimulating sales of radio apparatus was soon apparent and the other companies followed, nearly all within the last year or two years.

The Amateurs' Success

Much has been done also as regards amateur wireless work in China, hundreds of Chinese students having taken up radio with avidity. An Amateur Association, with a large membership roll and headquarters in Shanghai has been formed. Through this body, which is linked with the Amateur Radio Association of America, the Chinese enthusiasts have been in regular communication with their fellows in other parts of the world, and during the past season several wireless chess games were played between teams in Shanghai and Manila through the Association.



The High Power Station on Route Ferguson in Shanghai

Short-wave communication, incidentally, is just coming into vogue in China. A series of broadcasting tests have been conducted by the Kellogg station on 26.8 and 32.77 wave lengths, within the past few weeks, and with a fair degree of success. There have also been several short-wave conversations between Shanghai and New York and Shanghai and the Pacific Coast during the last year.

A serious crimp, however, has been put on the growth of efficient communication in China, as well as on the market for apparatus, by the split in the Nationalist party, complicated by the chronic war between the north and the south, causing a stagnation of business in the vast and important regions affected, and a great difficulty even in normal postal communications, rendered doubly acute by a censorship. This has been so noticeable that foreign correspondents on duty in the interior are beginning to include short-wave wireless sets in their equipment for communication with Tokyo, Manila, Shanghai, or some other point, to get off their dispatches free of censorship and to avoid delay. There is also a powerful short-wave set in operation in the French Concession, which has had satisfactory results in commnuication with Europe. Schenectady has frequently been heard here clearly on a set operated by the Radio Supply Company.

Impetus was recently given the entire movement in the Far East by the installation of a station by the Radio Corporation of America at Manila, where short-wave tests of a satisfactory nature were conducted with the company's stations in America, and by means of which the company plans to establish regular commercial service between Manila and San Francisco. For the past two years the Japanese Government has been exchanging commercial service with America through the air. Only China remains out of the circuit of international communication over the ether between East and West.

What the attitude of the Nationalist regime towards radio will be, has never been set forth. Both the Hankow and the Nanking Governments have been too busy organizing important financial and military matters to bother about radio, or to attempt to lift the ban on the importation of apparatus, beyond making use of the stations at their capitals. There is no doubt that some of the leaders have given thought to the matter, and there are rumors of official action to encourage the development of wireless communication and the uses of radio for propaganda purposes in Canton and Hankow. Certainly the progressive ideals of republican China always have tended towards the uses of radio as an educational medium, but thus far there has been no action.

Radio will boom in China some day, when these matters are ironed out. It will not boom as it did in America or Japan, but the market is certain to enjoy a wholesome expansion, and nationalist China, if it stays that way, can be assured of another important factor in removing the barriers to progress which have throttled all enterprises for centuries. The release of this industrial force will then be a little nearer, for radio communication in the modern state is becoming almost as vital as railroads. At least it will help to wipe out inter-sectional differences, and stimulate the nascent national consciousness. The West, and particularly America, foremost in radio development, is awaiting the turn.

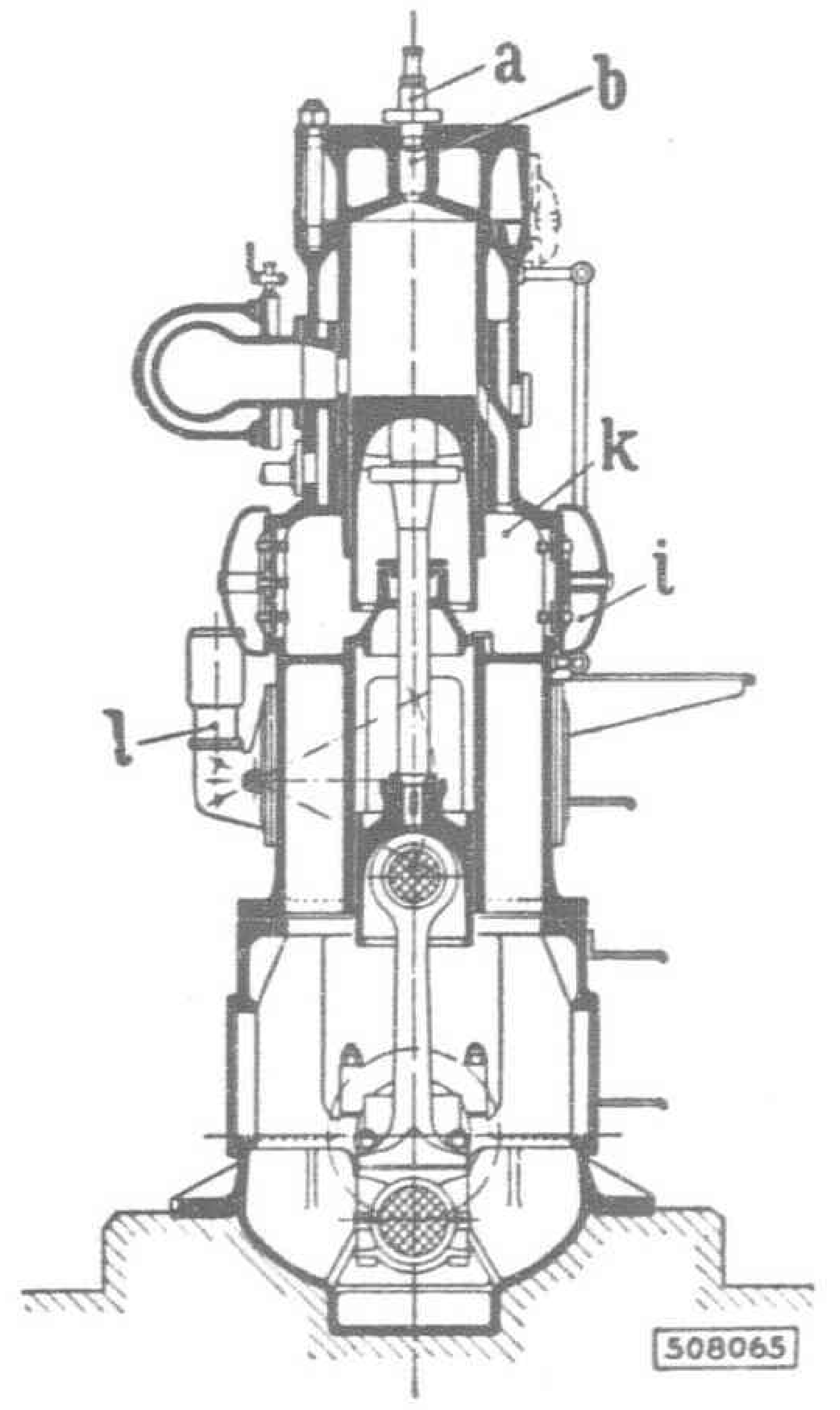
The Sulzer Airless Injection Two-Cycle Engine, Type "RK"

SULZER Brothers have brought out a new type of engine, differing outwardly from the previous designs of airless injection engines in that 2, 3 or 4 working cylinders are cast together in a single block. In designing this new type of engine, the following points were given special consideration : maximum simplicity with regard to construction and attendance ; greatest possible reliability ; increased economy in working ; reduced cost of production by building in series.

The engine works with a subsidiary ignition chamber and has no injection air compressor, no air inlet valve and no exhaust valve. The starting air valve is operated by an eccentric, whilst the fuel valve opens and closes automatically, in accordance with the pressure and delivery stroke of the fuel pump, which in its turn is automatically controlled by the governor according to the load on the engine. The number of parts in the engine is reduced to a minimum, and attendance and maintenance are rendered very simple.

The reliability and steady running of the engine are due to the fuel being ignited directly by the scavenging air into the working cylinders and thence into the exhaust piping ; in the crank case the lubricating oil is not contaminated by the products of combustion. All bearings (main, crankpin and crosshead bearings) are fitted with forced lubrication. In consequence of this, the lubricating oil consumption is lower than in any other Diesel engine of the same size. The exceptionally low lubricating oil consumption and the low cost of maintenance due to the simplicity of the engine, compensate amply for the slightly higher fuel consumption as compared with a four-cycle engine. This engine has consequently the highest overall commercial efficiency.

In order to reduce the cost of construction as much as possible, a number of models with 2, 3, 4, 5, 6 and 8 cylinders have been designed, each cylinder having an output of 50 B.H.P., so that engines with normal outputs ranging from 100 to 400 B.H.P. can be supplied. The 5, 6 and 8 cylinder engines are built up from two block units of 2, 3 or 4 cylinders, each block having one common water jacket for cooling the cylinders in it. This by its injection into the compressed air in the ignition chamber, thus ensuring good atomisation. The engine can be started up at any time without any preparation and runs very steadily even under varying loads. There is only one hole in the fuel spray plate, and it can be made large enough to preclude any danger of its becoming stopped up. As shown in the sectional view, the under side of the piston is designed to serve as a scavenging air pump. The new engine differs from the old type in that a crosshead and piston rod are fitted and that the scavenging air chamber is completely separated from the crank case by a plate fitted with a stuffiing box through which the piston rod passes. As regards economy in working, these alterations give more efficient scavenging and charging and consequently improve the conditions for combustion. The fuel consumption of the new engine is lower than that of similarly sized two-cycle Diesel engines of other systems.



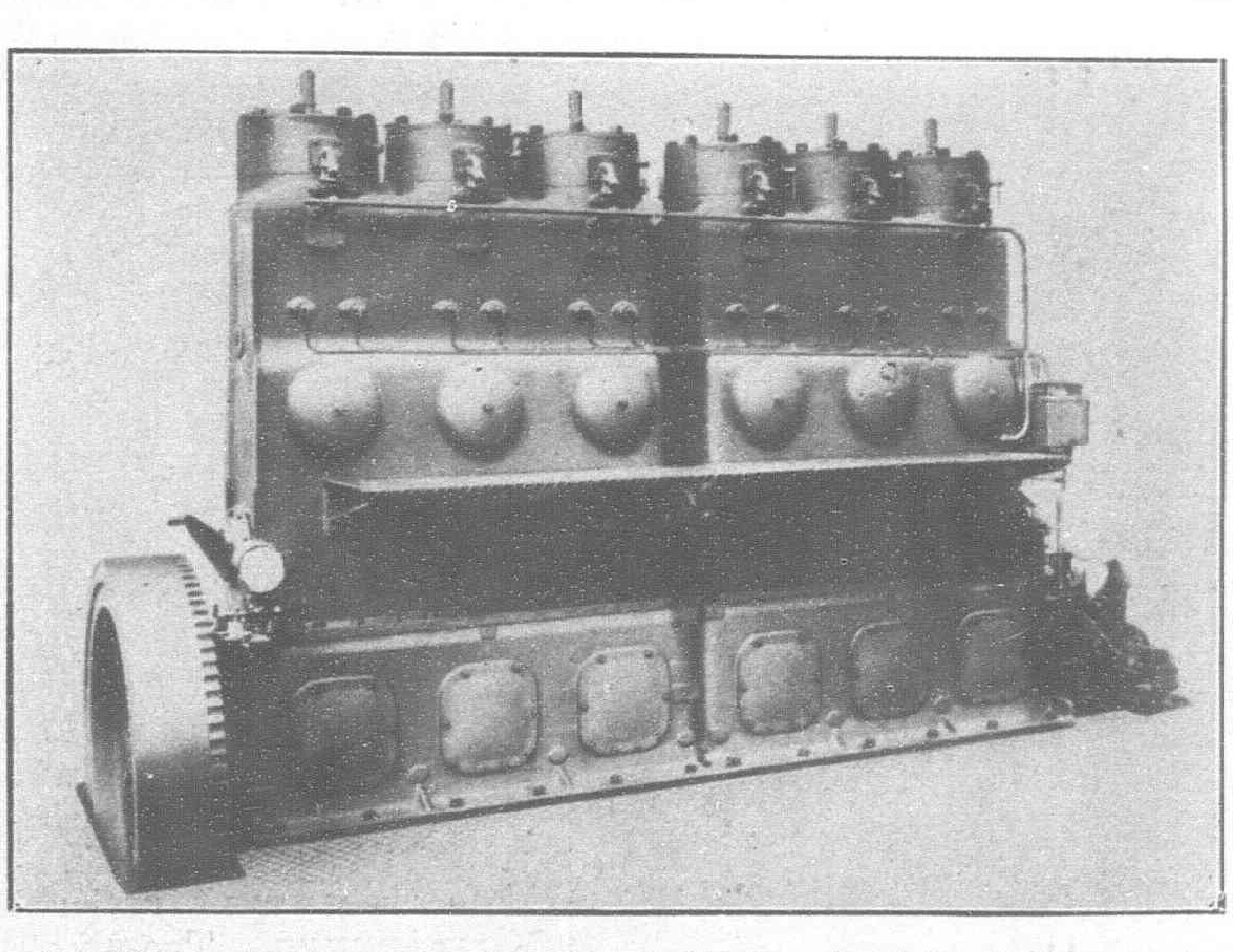
a Fuel valve
b Subsidiary chamber
i Scavenging air valve
k Scavenging air chamber
l Auxiliary compressor for filling starting-air bottles

Airless Injection Sulzer Two-cycle Diesel Engine, Type R.K.

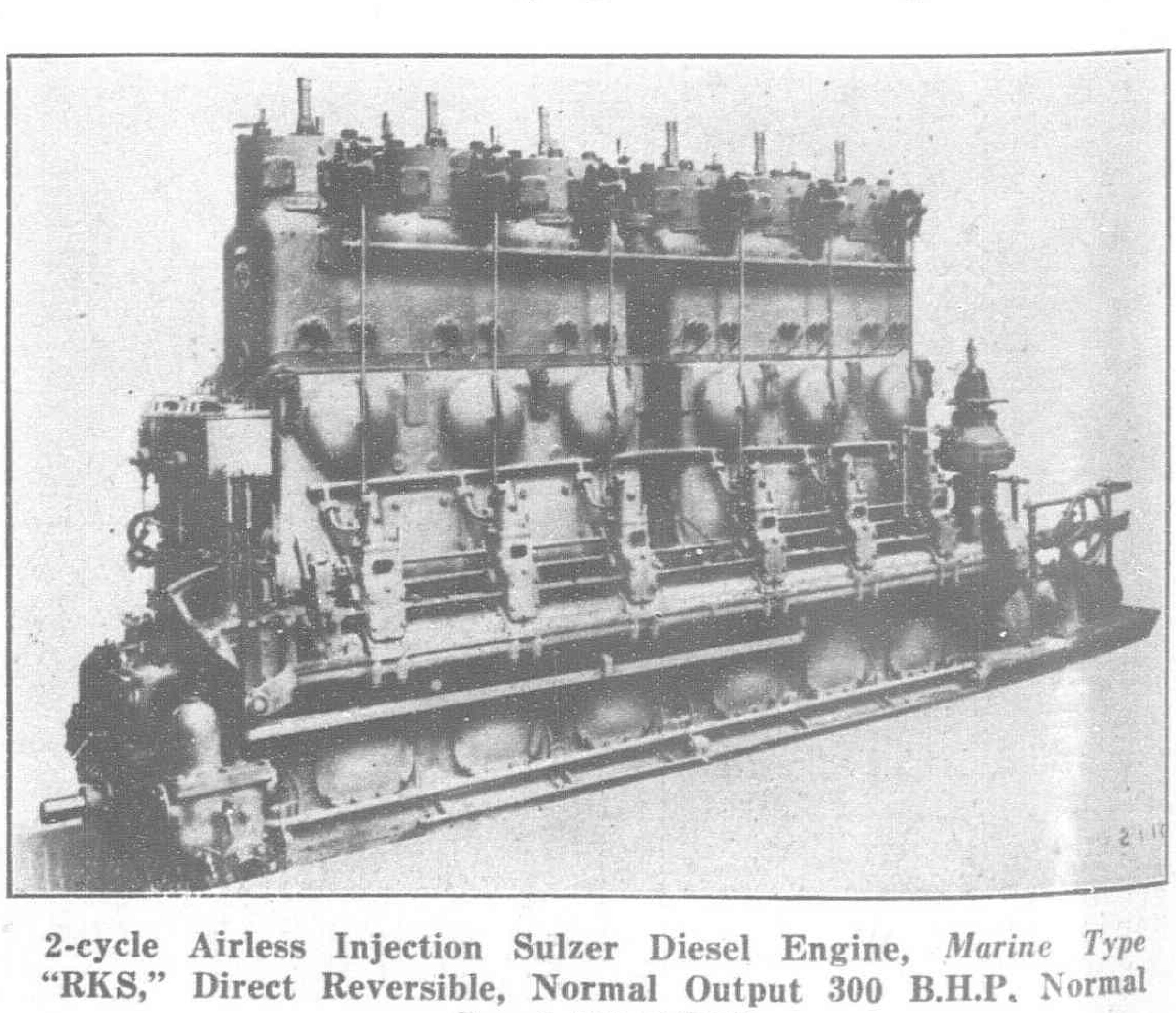
Because of the arrangement of the scavenging air chamber, the lubricating oil thrown from the bearings into the crank case, cannot be carried over method of construction offers not only great advantages from the manufacturing point of view, but also makes the engine rigid.

The speed of all engines is the same, 300 revs. per min. Each engine is fitted with a device that allows the speed to be adjusted by 5 per cent. while the engine is running. The governing is remarkable for its closeness and reliability. The engines are consequently particularly suitable for driving electric generators.

In order to facilitate coupling to the machine it has to drive, the crankshaft of all engines is provided with a forged flange to which the extension shaft is connected. In this manner it is possible to finish the engine and its crankshaft completely and to make the extension shaft later when the use to which the engine will be put is known and the method of drive has been settled. When an electric generator is to be driven the rotor can be made in one piece, since it and the extension shaft can easily be fitted or removed together when erecting or when carrying out extensive repairs.



300-B.H.P. Airless-Injection Diesel Engine 6-RK-30 (300 r.p.m.) Each Engine fitted with device permitting Speed Adjustment up to 5% while Engine is Running



2-cycle Airless Injection Sulzer Diesel Engine, *Marine Type* "RKS," Direct Reversible, Normal Output 300 B.H.P. Normal Speed 300 R.P.M.

The Hwai River Bridge of the Tientsin-Pukow Railway

Oddities of Trade in the Hwai River Basin

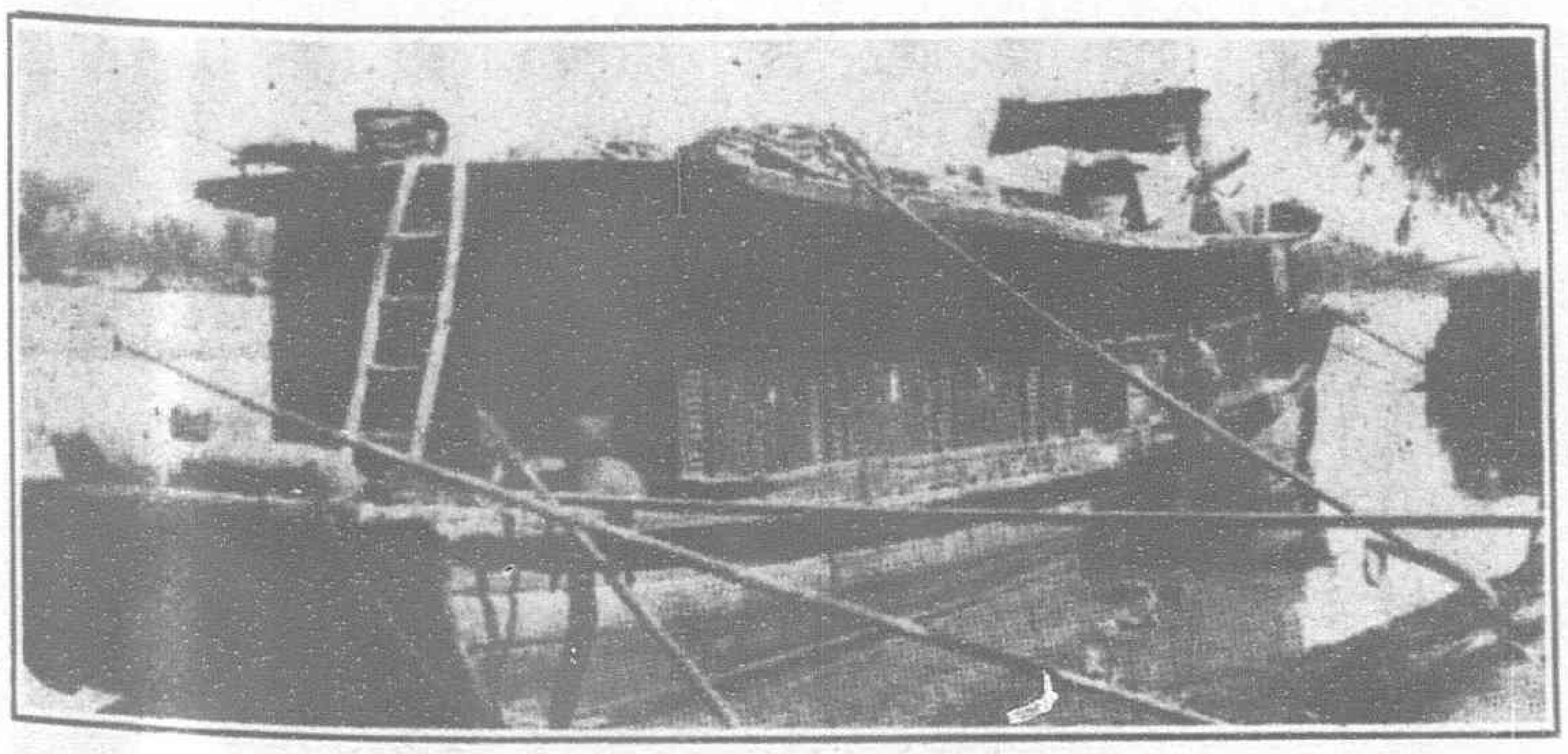
By John K. Davis, American Consul-General, Nanking

THE Hwai River is one of the many little-known rivers of China of much importance in the distribution of trade. It rises in the southeastern corner of Honan Province and flows eastward through the Province of Anhwei into Hungtze Lake, whence its waters find egress through the Grand Canal to the mighty Yangtze. The Hwai and its tributaries, in conjunction with the Tientsin-Pukow Railway and the Grand Canal, form a natural system for the assembly and distribution of merchandise throughout all north central Anhwei, serving with remarkable facility and completeness the traffic needs of one of the most thickly populated regions of China.

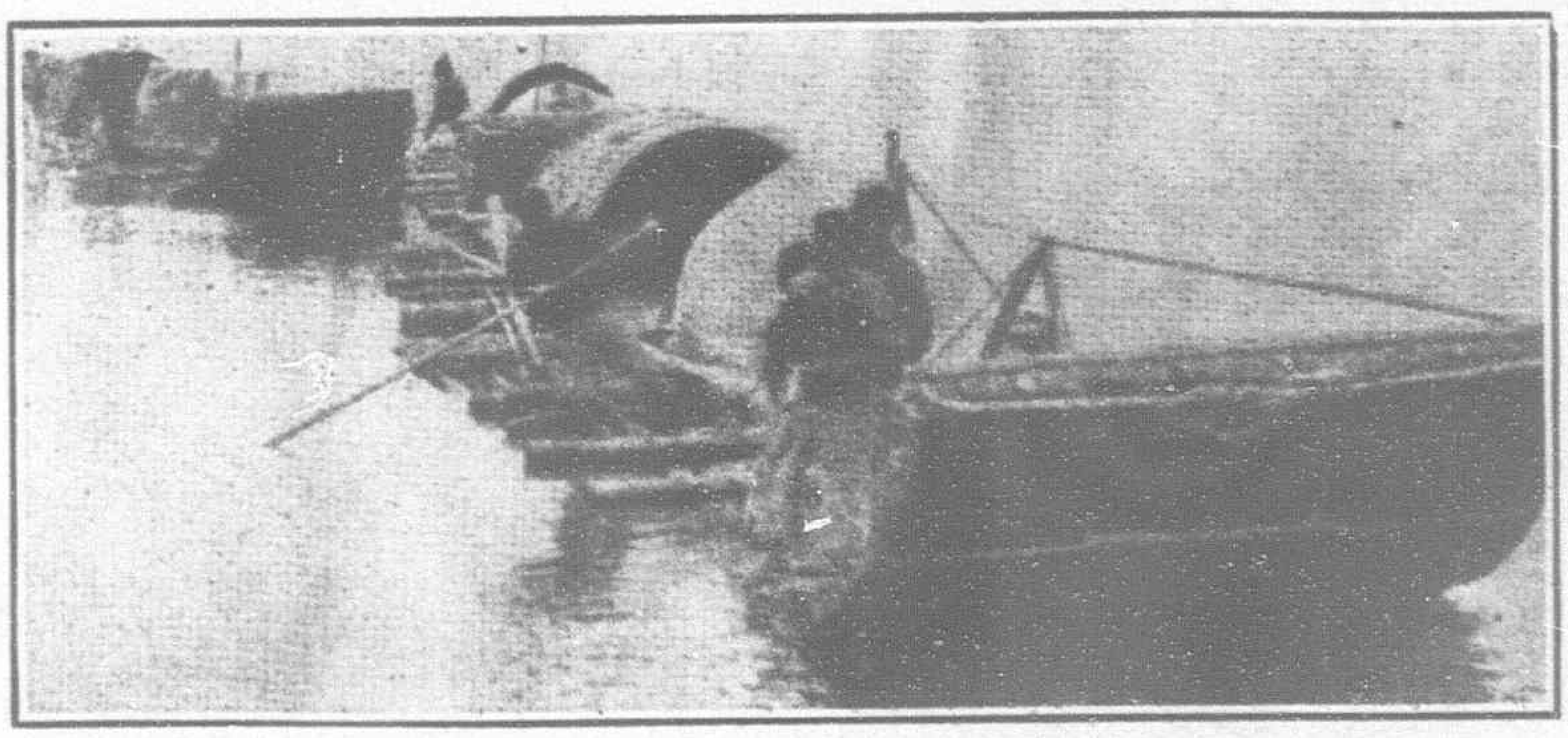
Floods Change Course of Rivers

Many centuries ago the Hwai discharged its waters into the Yellow Sea near Haichow, in Kiangsu Province, while the Yellow River, "the scourge of China," discharged into the sea near Tientsin; but about the thirteenth century calamitous floods broke the dikes of the Yellow River and pushed its entire volume across country and into the channel of the Hwai. After their union the greater river forced the lesser from its bed and the waters of the latter sought a new outlet across the low-lying lands west of the Grand Canal to the River Yangtze.

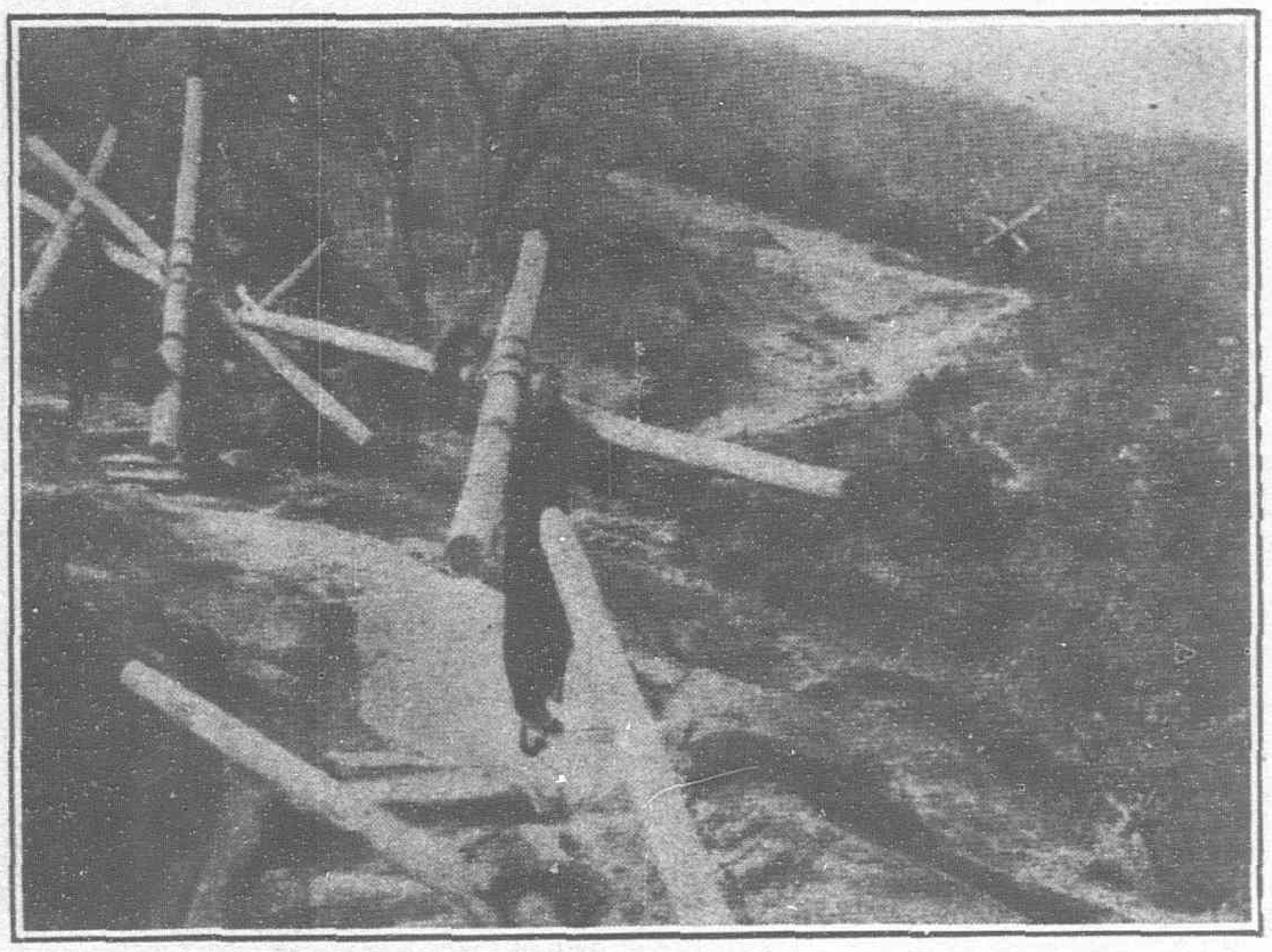
For the past three-quarters of a century the constant menace to the entire Hwai River Basin from frequently recurring floods has occasioned many plans for diking and drainage of the river and for the maintenance and improvement of the Grand Canal. In 1914 engineers who were sent out by the American Red Cross made a thorough investigation of flood-prevention possibilities, and six years later a distinguished American engineer presented to the Chinese Government an exhaustive plan for draining the Hwai River Basin into the sea at a cost of less than $6,000,000 in gold, as compared with previous plans for an estimated cost of $90,000,000.



Passenger Barge Operated between Pengpu and Chengyangkwan



A Raft-boat Built of Bamboo for use in Extremely Shallow Streams



Coolies Carrying Poles over Mountain Road

Productivity of the Hwai Basin—Pengpu, Trade Centre

The Hwai Basin embraces approximately 21,600 square miles of an exceedingly fertile and productive country. Over 90 per cent. of the population is made up of farmers, and the principal crops grown are wheat, soy beans, sesamum, kafir corn, maize, China jute, tea, and rice, and approximately 60 per cent. of the farms are double-cropped. Of those crops which furnish an exportable surplus and whose yields serve as indexes of the purchasing potentialities of the people, wheat constitutes, roughly, 50 per cent. and soy beans 30 per cent. The average farm of the region contains only about 4.1 acres, while farms are frequently as small as 1 acre. The average family is 5.4 persons, and the average family income around $160 in silver per annum. The average value of the farm produce used by each family is silver $199, and thus the average total income of a Chinese family in the Hwai River Basin may be estimated at silver $359 per year, or, say, $163, reckoning silver exchange at 2.20.

Pengpu, the most important trade centre of the region, is situated at the intersection of the Tientsin-Pukow Railway and the Hwai River, 109 miles by rail from Pukow. All the produce of the region is gathered here and carried by rail to Shanghai, while imported goods come up from the coast ports by rail to Pengpu and are thence distributed by junk service on the Hwai or its tributaries throughout the interior.

Indirect Bartering

The greater part of the trade of the Hwai River district, including that involving American manufactured merchandise, is in the form of indirect barter, mainly owing to the absence of modern banks in nearly all the interior cities and towns, and because most of the Chinese firms bringing foreign goods into the Hwai River Valley pay for them by sending out local agricultural produce.

When imported goods are sent up country, the consignee is debited with the amount of their cost, and when beans, wheat, hemp, or other products of the interior are sent down, the amounts realized from them are placed to his credit. Where currency is used, the general media of exchange are the Chinese silver dollar and the fractional silver 25-cent and copper 1-cent pieces, whose exchange rates are subjected to constant and wide fluctuations. At present, there is a great shortage of silver dollars. In the district served by the Pi River, a tributary of the Hwai, there are practically no Chinese silver dollars, their place being taken by Spanish dollars, whose mint dates vary from 1773 to 1810. It is one of the curiosities of trade that these old Spanish dollars circulate at a premium.

Variety of Foreign Goods Sold

A considerable variety of foreign manufactures is now sold in the Hwai River Valley. The more important lines are cigarettes, kerosene oil, sugar, indigo, cotton goods, soda, paper and matches. Kerosene oil, cigarettes, and indigo are the principal articles of American origin, but less important commodities which also find a good sale are wire, nails, galvanized iron sheets, lamps, and lanterns. Imports emanating from the United Kingdom are soda, sugar, cigarettes, cotton goods and kerosene oil. Germany has a share in the indigo market and in various lines of cheap hardware, while Japan supplies cheap hardware, enamel and aluminum ware, cotton goods and sugar.

Special Types of Watercraft in Use

Every district of China has evolved a special type of watercraft to meet the requirements of its streams, and along the Hwai and its tributaries are found junks and sampans of a surprising diversity of construction, each devised for some special purpose. In the smaller streams, such as the Pi, during the dry seasons the water is so low and rapids so frequent that even junks of the shallowest draft can not operate. Here the ingenious Chinese boatman has evolved a unique type of raft-boat, made by fastening bamboos together so as to form a platform capable of supporting no small amount of cargo, but which will float in no more than a few inches of water. The forward ends of the bamboos are bent upward, to prevent the rafts catching on rocks or other obstacles as they glide over the shallow waters.

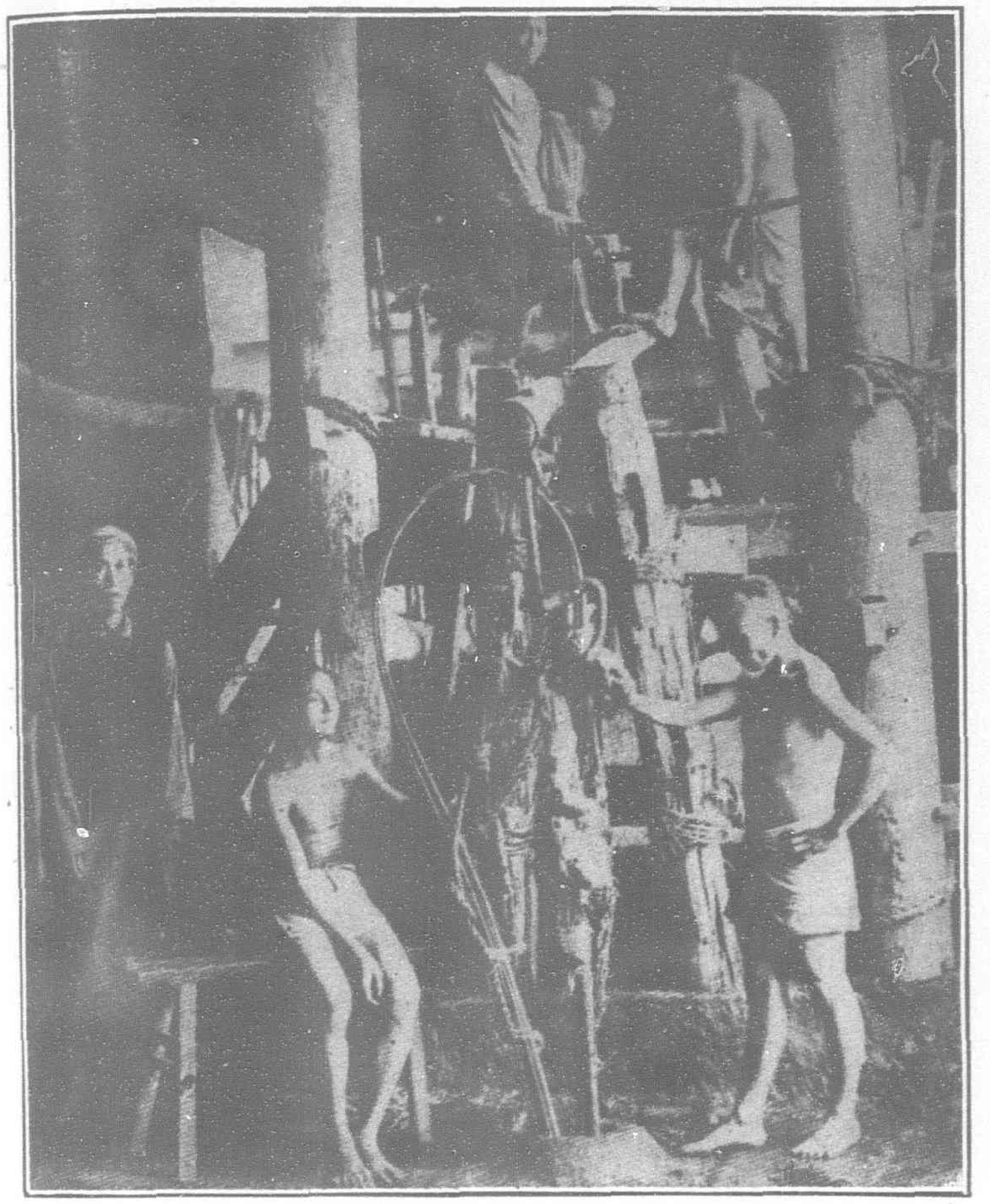
Another unique craft is the passenger barge. Cabin passengers have the use of very small state-rooms, running about a side deck only wide enough for foot passage, while deck passengers are carried in the space between the tops of the state-rooms and the roof of the barge. Compared with travel comforts in the United States the accommodations on these barges are crude, but in a primitive, rural Chinese district they are regarded as convenient and comfortable. Power is supplied by coolies with strong arms and long poles.

Off the waterways and railway goods and passengers are moved by crude two-wheeled carts—by animals, or carrying coolies, and by wheelbarrows. The passenger carts are built with two enormous iron-studded wheels fastened firmly to the axle, with a small covered compartment immediately over the axle in which the passengers ride, their feet doubled up under them. The driver sits on a small platform between the shafts, and lets his legs dangle over the side. As the carts have no springs, this is not a comfortable means of travel. The wheelbarrow is of the same general types as used throughout North China. It has a platform on either side of the huge wheel, upon which the goods are tied with ropes.

Cost of Transporting Goods

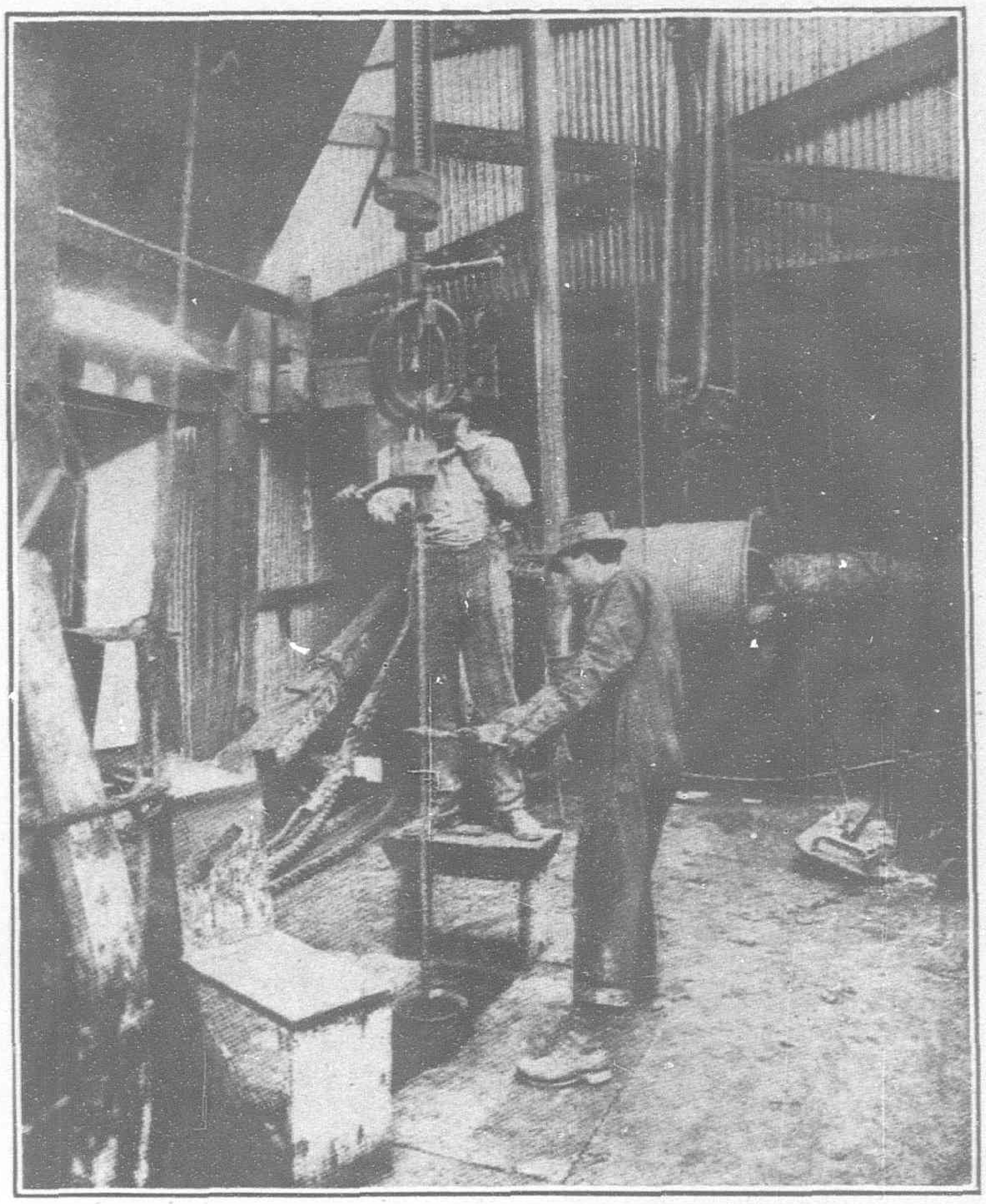
The cost of transporting goods to and in the Hwai River Basin varies greatly, according to the kind of goods and the means of transport. In general the costs of moving merchandise are steadily and markedly advancing, in keeping with the unusual economic and political developments that are now taking place throughout China.

Wheelbarrow Transporting Freight in the Hwai District



The "kicking-down" method of drilling, explained in text on preceding page. The two upright timbers support a spool mounted twenty feet above the well. In pulling out, the line is passed over this spool and out to a bull-wheel located a hundred feet from the rig. Water buffaloes supply the power

(Photo Courtesy Dr. N. L. Taliaferro, Department of Geology, University of California)



The Pennsylvanian, standard or cable-tool method of drilling. In principle it is not different from the old Chinese system illustrated on opposite page. The men are hitching on the temper-screw; the driller is tightening the clamps while his tool-dresser is putting a back-twist in the drilling-line

Evolution of Well-Drilling*

THE Chinese, who perhaps gave to the world its first mariners' compass and invented gunpowder, also are credited with having been the first people to drill holes in the ground for the purpose of recovering mineral substances of commercial value. It was salt—specificially, salt-impregnated water, or brine—those early Chinese drillers sought, and their activities in quest of it stand as the beginning of well-drilling.

Undoubtedly brine was at first obtained by the Chinese from salt springs, later from shallow pits; and as the demand for the commodity increased and the surface supply was depleted, some enterprising Mongolian must have conceived the very logical idea that greater quantities could be found in the depths of the earth, from where their supply near the surface seemed to come. So well-drilling was undertaken.

Such enterprises required the development of methods, equipment, and technique. This development extended through many centuries, but by dint of much hard work and perseverance it was achieved, and early in the Christian era the Chinese were able to drill wells to the comparatively great depth of three thousand feet. The methods and equipment employed when this stage of development was reached continued to be used by the Chinese, without any great changes, almost up to the present day.

The basic principle of the Chinese method of drilling is very simple: a cutting-tool suspended from a flexible drilling-line was alternately raised and dropped, and the percussion served to cut and crumble the rock on the bottom of the hole. To obtain the lifting and dropping action the coolies went through a continuous gymnastic performance; from a platform the jumped on a spring-pole from which the string of tools was suspended. This end carrying the drillstring rose with the impact of a jumper on the opposite end, thus raising the tools, and fell as he jumped off, permitting the tools to drop and strike a crushing blow at the bottom of the hole.

A slight variation of the method just described, but a vast improvement, for it eliminated much waste effort, is known as the "kicking-down" system of drilling. No jumping is necessary. The workmen whose activities lend action to the beam remain on the platform which parallels it. To raise the tools each man has merely to shift his weight to the foot placed on the beam, which is counter-balanced. The counter-weight alone is not sufficiently heavy to hold the tools suspended, so, relieved of the men's weight, the rear end of the beam rises again, and the end to which the drilling-line is attached descends, allowing the tools to strike the blow that results in "hole." In this way from twenty to forty strokes per minute are achieved. This is more efficient than the system practiced on some rigs where the coolies step from the platform to the beam, and then up to a platform on the other side.

Until recent years, when the Chinese adopted small steam-engines, used in place of water-buffaloes for bailing and "pulling out," all power was furnished by men and animals. And almost identical methods—the spring-pole and kicking-down systems—were employed to drill brine wells in the United States until 1859.

That year is a most important date in the annals of the petroleum industry: in May, 1859, Colonel E. L. Drake's famous well on Oil Creek, near Titusville, Pennsylvania, was spudden-in, It was brought in on August 27th of that year with an initial production of about twenty barrels, and stands as the world's first oil-well, for it was the first well ever to be drilled for the sole and express purpose of obtaining oil. Long before this time, however, pits had been dug by hand to the same end, notably in Burma (India), Palestine, Ecuador, and Cuba.

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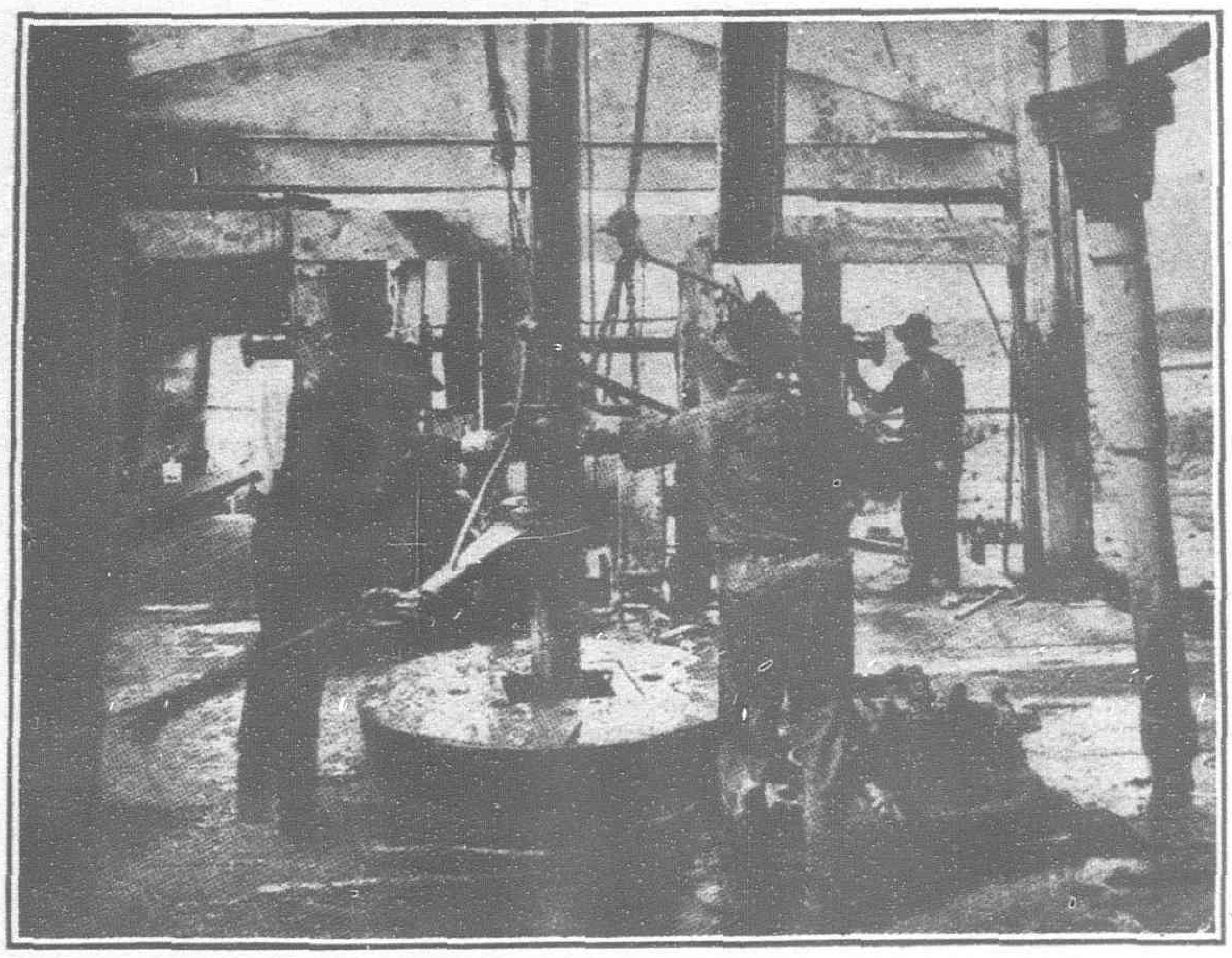
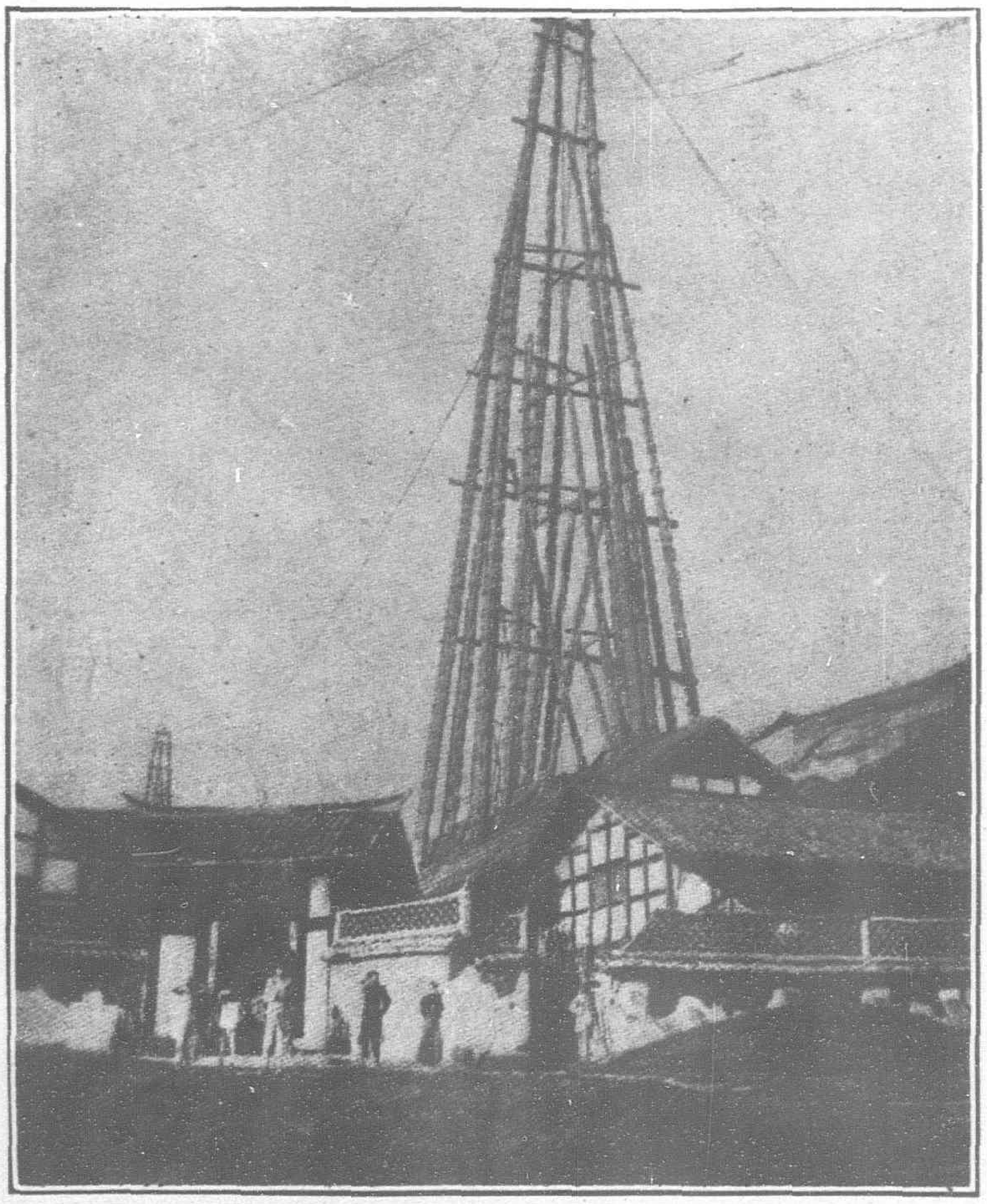
*Standard Oil Bulletin

Drake's well was more than the first oil-well to be drilled: it was the first well on which steam-power was used to operate the drilling machinery. And it was still more than that: after encountering much trouble, due to caving of the hole, Drake conceived the idea of driving pipe through the loose sands and gravel near the surface. This enabled him to penetrate to hard formation, where drilling with his steam-driven equipment was started. The use of drive-pipe, initiated by Drake, to shut out surface-water infiltrations and to prevent the hole from caving while drilling was in progress, is invariably practiced to-day, and constitutes another of this pioneer's important contributions to the science of well-drilling.



Derrick floor of a well being drilled with rotary equipment. Drilling was not in progress when the view was taken; they were "coming out," and the crew was photographed in the act of "breaking" a joint in six-inch drill-pipe

More than 300,000 oil-wells have been drilled since men trained in brine-well drilling, using the tools with which they were familiar, obtained oil production at a depth of about seventy feet, under the direction of Drake. The percussion method used in drilling this first well later became known as "Pennsylvanian," "standard," or "cable-tool" method. Basically, it is not different from the method developed by the Chinese early in the Christian era. Until 1901, when a radical departure was made (to be described later), all oil-wells were drilled with cable-tools. But great changes and improvements in tools and equipment were soon under way. Though Drake obtained production at about seventy feet, it was soon learned that oil could not always be had from such shallow depths. Experience made it plain that deeper drilling was necessary. Incidentally, the oil industry is to-day realizing this same fact over again. Deeper drilling necessitated improvement in tools, equipment, and technique, and was largely responsible for the rapidity with which such improvements came.



A Chinese drilling rig. The legs of the derrick are composed of cedar or pine poles, eight to ten inches in diameter, bound together every two feet with bamboo rope. There are no true braces—framed diagonal pieces set in an angle—in the Chinese derrick

(Photo Courtesy Dr. N. L. Taliaferro, Department of Geology, University of California)

Specialists in the construction and manufacture of tools entered the field, and it was not long before the making of oil-well equipment became a separate branch of the industry. It is a big jump from Drake's 34-foot derrick to the standard 125-foot derrick of to-day; and the little tools wrought by Drake's men, weighing but two hundred pounds, scarcely more than suggest the ponderous equipment now in use. New knowledge and necessity led to changes in equipment that made deep drilling possible.

Now comes the rotary. Loose, unconsolidated formations encountered in the Gulf Coast region militated greatly against drilling with cable-tools. On occasions they proved well-nigh useless there. The rotary proved to be exactly what was needed. Using this method of drilling, searchers for oil were able to reach depths and oil-bearing strata attained only after much drilling through unconsolidated formations. Thus an entirely different system came to be utilized for drilling oil-wells. It did not displace the one in vogue; we now have two methods instead of one. The basic difference is tersely stated in the slang of oil-field mechanics, who jocularly refer to the "up-and-down" and the "round-and-around" methods.

The rotary method is based on a modification of an invention of Fauvelle, evolved in 1845, and used to drill water-wells. Briefly, this system calls for the continuous rotation of a column of pipe with a cutting-bit on the end in the earth. Circulation is maintained while it is rotating; originally, water was forced down through the pipe. The pressure applied returned the water to the surface, its upward course being between the walls of the hole and the outer surface of the drill-pipe. It brings up with it the cuttings made by the bit. It was learned that if fluid mud were used instead of water the walls of the hole were less likely to cave; the rotary action plastered the walls with the mud and held them in place. So pumps were designed to handle mud instead of water, and mud is used in oil-well rotary drilling. It is not unusual for "open" hole to be maintained for three thousand feet before casing is inserted to shut off water-sands.

The first application of the rotary method to oil-well drilling was made by Captain A. F. Lucas, at Spindletop, Texas, in 1910, resulting in the Gulf Coast fields being accounted the home of the rotary oil rig, as similarly Pennsylvania is held to be the birthplace of the cable-tool method.

In 1908 the rotary method was first used in California, to combat the soft formations which had been causing cable-tool drillers much grief. In this state rapid progress was made in adapting this new method to deep well-drilling. Improvements in tools, heavier tools and heavier equipment, and improved technique on the part of the drillers, sum up that progress. In 1922 and 1923, using the rotary method, the Standard Oil Company of California drilled a hole in the Santa Fe Springs field, Los Angeles County, to a depth of 7,214 feet, at that time the world depth-record for rotary drilling. Following this lead, and with this Company's experience as a guide, other companies have bettered that record. In 1925 a well was drilled with a rotary to a depth of 7,602 feet, to date the deepest well in the world to produce only oil; and in 1926 a well was drilled in the Olinda field, southern California, to a depth of 8,046 feet—the deepest hole ever drilled, but a dry one. It is now considered no unusual feat to drill wells to 5,000 feet with a rotary rig; in the Ventura Avenue field, in Ventura County, California, prolific producers are brought in from depths of 5,000 to 6,000 feet. These wells as a group, however, stand as the deepest producers on a commercial scale in the world.

The increase in the size and strength of tools and equipment, and the improved technique of the drillers, have made possible the attainment of these greater depths in California oil-fields. Even ten years ago a hole successfully drilled to 3,000 feet was considered quite an accomplishment. To-day such a depth is considered only a good start — a good point to set a heavy string of casing to permit continuance of drilling to twice that depth.

Looking into the future, it seems within the bounds of reason that before many years have elapsed we may see successful drilling to depths of 10,000 to 12,000 feet. With profitable returns as an incentive, the initiative American oil operator is urged on to continuous research and development, outstanding factors in America's world leadership in the petroleum industry.

Natural Resources of Tunhwa and Omu, Manchuria

TUNHWA and Omu are two *hsien* districts lying to the east of Kirin City, Kirin province. The Kirin-Tunhwa Railway, covering a total length of 480 *li*, is being built from Kirin to Tunhwa through Omu. These two districts, hitherto thinly populated and little known to the outside world, are expected to grow in importance after the completion of the railway. The soil is highly fertile, while the primeval forests abound in fur-bearing animals and medicinal herbs.

I.—TUNHWA.

The district covers a total area of about 20,000 square *li* and has a population of about 34,000 at present. Its clayey soil is highly suitable for growing various agricultural crops, such as wheat, soybean, millet, maize, barley, peas and gawa millet. According to an investigation, in 1923, about 55,950 *sheng* (a *sheng* covers 2,880 square *kung* and is equivalent to about 10 *mow*) were cultivated with different kinds of cereal crops, of which wheat formed about 40 per cent and soybean, 20 per cent. The average quantity of yield per *sheng* in the year was: wheat, 3 piculs, soybean, 6 piculs, millet, 6 piculs, maize, 7 piculs, gawa millet, 8 piculs, barley, 8 piculs and peas, 3 piculs. The growing season covers a little more than four months a year; crops sown in April are harvested in July or August. Frost sets in about the middle of September and thaw in the beginning of April. In spite of the short growing season, the crops grow well and the annual rainfall is quite adequate for their needs. During the slack seasons, the farmers are engaged in gathering fungi and medicinal herbs and hunting fur-bearing animals. The fungi grow on decaying stumps in the forests, and are gathered in due season and dried for the market. Two species of fungi are of particular note: "jew's ear" growing on oak and its allied species and *Yuan Mo*, gathered from the decaying trunks of certain kinds of conifers. "Jew's ear" is sold on the local market at 100 *strings* of cash per catty and *Yuan Mo*, at 40 *strings* per catty (The exchange value of a *string* of cash in local official notes of Kirin fluctuates from time to time but is always much lower than that of a *string* in Peking, the latter being equivalent to 10 coppers or 2.5 cents according to the current exchange rate.) The yearly production figure of "Jew's ear" is about 10,000 catties and that of *Yuan Mo*, 200,000 catties. Both are consumed as table delicacies. Among the half a dozen kinds of medicinal herbs, ginseng is most highly prized. There are two species: the cultivated variety is sold at a little over 200 *strings* per ounce ($\frac{1}{16}$ of a catty), while the wild specimen fetches a price ten or fifteen times higher than that of the cultivated kind. The yearly output of the latter hardly exceeds a few catties. Certain quantities of deer's horn in velvet, also highly prized for its medicinal value, are also produced in the district.

Among the fur-bearing animals, there are the squirrel and the *li* an animal allied to the fox. The woods are also haunted by tigers, wolves and wild pigs. The local inhabitants hunt these animals chiefly for their skins. A piece of tiger skin, in perfectly good condition, is worth on the local market some 50,000 *strings* of cash, a piece of *li* skin, 2,000-3,000 *strings*, a piece of wolf skin, 500 *strings*, a piece of a wild pig skin, 500 strings and a piece of squirrel skin, 100 *strings*.

At present, transportation of goods from Tunhwa to Kirin depends entirely on pack horses, although horse wagons are sometimes employed. Each pack horse, carrying 200 catties (2 piculs,) covers the journey between Tunhwa and Kirin (about 480 *li* apart), in five days in winter and a week or eight days in summer. A wagon, drawn by a team of four horses, is capable of carrying 3,000 catties and covers the journey in about the same time. A form of sleigh drawn by a team of three horses is employed for carrying goods and passengers in winter. It carries about 1,500 catties and covers the journey in four and a half days. The cost for transporting 100 catties of cargo from Tunhwa to Kirin is about 400 *strings* of cash in winter and 600 *strings* in summer. In winter, the roads, when frozen hard, are in a much better condition.

II.—OMU

Omu is about 100 *li* north-west of Tunhwa and is a mountainous district. It covers a total area of about 20,000 square *li* and has a population of 32,000 souls. The soil of the district is comparatively thin, the surface soil having been more or less washed away by the floods from the mountains. The total cultivated land of the district is estimated at about 60,000 *sheng* and the staple crops consist of millet, maize, wheat, barley, gawa millet and rice. The average yearly yield of the different crops per *sheng* is: soybean, 5 piculs; wheat, 3 piculs; millet, 5 piculs; maize, 6 piculs; barley, 7 piculs; gawa millet, 7 piculs; rice 14 piculs. The farm produce is more than sufficient for feeding the local population, the surplus, amounting to 50,000-60,000 piculs of different kinds of cereals in a normal year, being exported to Kirin. The overland means of transportation of the district are similar to those of Tunhwa; there is, however, the Kiaoho, a local stream, which is navigable for junk traffic in warm seasons. The greater part of the countryside, through which the projected Kirin-Tunhwa Railway is to traverse, is cultivated. Most of the farmers are small tenants or freeholders, there being only a few large farms covering 70 or 80 *sheng*.

Besides farming, the local inhabitants are also engaged in timber-felling. The neighboring mountainous regious at Laoyehlin and Changkwangtsailin abound in primeval forests. The logs are felled and flumed down the Lafa River to Kirin in rafts. Timber tracts situated far from the stream are felled for the local market to be used as fuel or house building materials. Timber felling is usually done in September or October, just after the farming season. The felled logs are transported to the nearest stream in sleighs. When thaw sets in, the logs are fastened into rafts and floated down the stream to Kirin. Timber-felling is, however, an enterprise requiring considerable capital. The farmers usually hire themselves to the regular timber merchants at daily wages of about 100 *strings* of cash with free board and lodging.

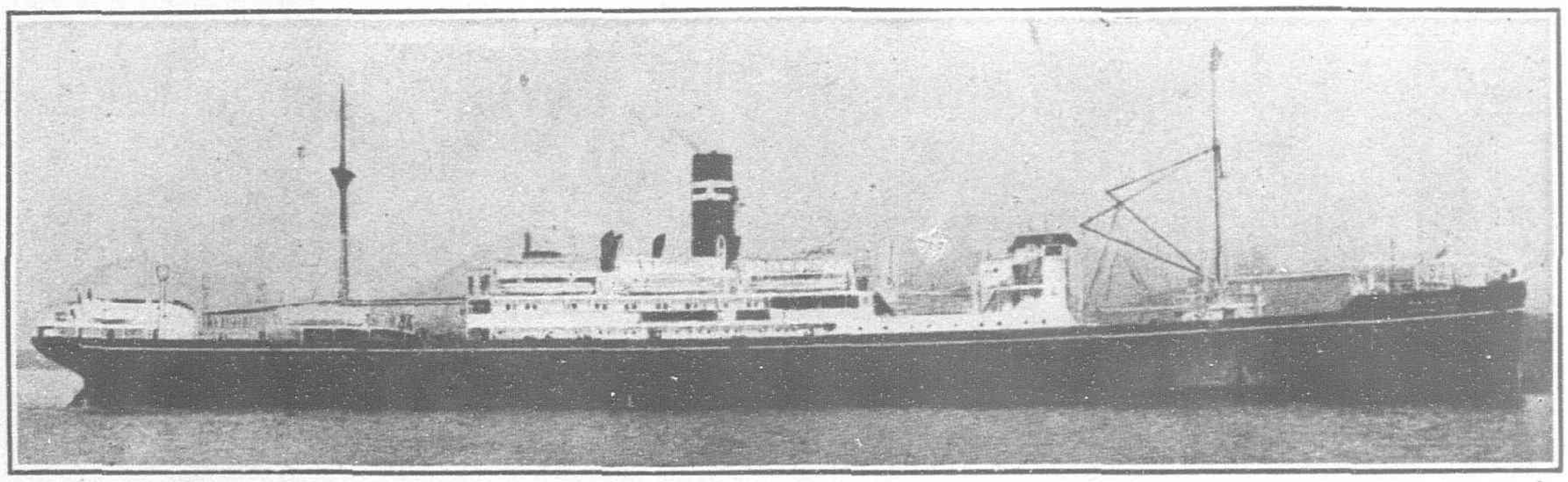
The district also abounds in mineral products. Two gold mines, one lead mine and several coal mines have been discovered in the district. The coal mine at Luannikou was discovered more than a century ago and worked successively by a number of operators. At one time, about the end of the last century, over 1,000 miners were employed and the yearly output exceeded 10,000 tons. Operations have, however, been suspended since 1900 owing to the flooding of the mines. The coal mine at Saisungnanshan was worked about a decade ago for a year. The operations have since been suspended owing to unsatisfactory results. The coal mines at Wulungtun are partly worked by the Teh Hsing Company and partly by the Tien Yi Company the latter being a Sino-British joint enterprise. Both companies work on a limited scale. The Teh Hsing Company has been in operation since 1907. It has a sales department in Kirin City. The bulk of its output, hardly exceeding 500 tons a year, is consumed at Kiaohochen and in Kirin city. The company employs about a score of miners, working with primitive methods. The coal mine worked by the Tien Yi Company was discovered about 40 years ago. It was worked intermittently for sometime before the Tien Yi Company took over the mining rights. The coal is a little inferior in quality to the product of the Teh Hsing Company. The two gold mines are located at Peitayang about 70 *li* north-west of the city and Hukiatien both producing placer gold. They were once worked by certain capitalists but the operations are now suspended.

Round the World Passenger-Cargo Fleet*

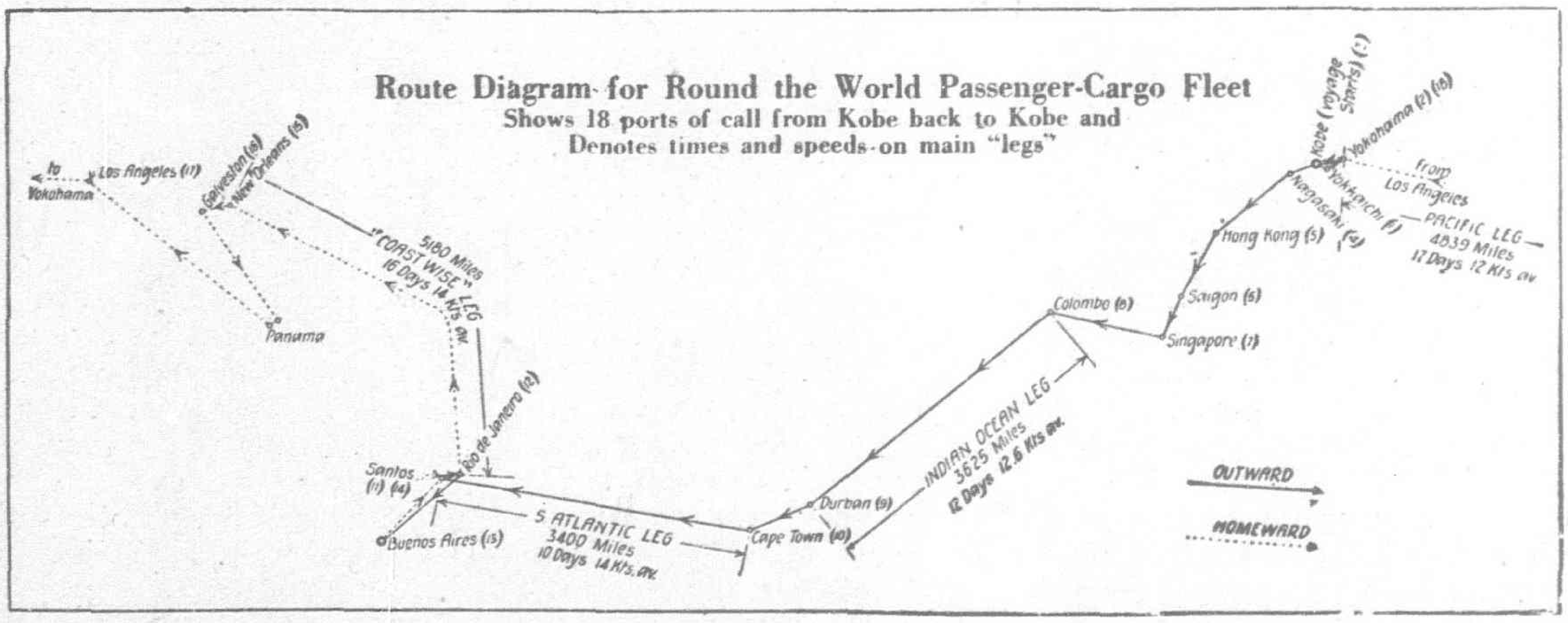
Japanese Company Operating Fast Motorships From Far East to South African, South American, and Gulf Ports

THE arrival at Kobe on January 24 of the Japanese motorship *Montevideo Maru* marked the completion of voyage No. 1 of this 7,000 tons gross motorship powered by Japanese built Sulzer Diesels of 4,600 b.hp. This vessel, owned and operated by Osaka Shosen Kaisha left Los Angeles on January 4, on the last leg of a round-the-world service which originates in Japan, continues via Straits Settlements and South Africa to South America, whence the route goes to New Orleans and Galveston, thence via Panama to Los Angeles and so back to Japan. The service is at present maintained by *Ms. Montevideo Maru* and two sister motorships *Santos Maru* and *La Plata Maru*, in conjunction with two steamers *Hawaii Maru* and *Manila Maru*, both of which latter are slated to be taken off the route as soon as they can be replaced by new fast motorships. Here then is a round-the-world service which, like the majority of existing similar services is almost exclusively a motorship one, except that it neither commences nor terminates in New York, nor uses Suez Canal and the Mediterranean.

The service was commenced in 1916 in order to establish a direct communication between Japan and South America via South African ports, carrying merchandise and passengers from Japanese ports as well as from the ports of call. Starting from Kobe the vessels run to Yokkaichi, then to Yokohama, then back again to Kobe, after which the Far Eastern ports of call are Nagasaki, Hongkong, Saigon, Singapore and Colombo. From Colombo the vessels make a long run across the Indian Ocean to Durban, which distance is covered in about 12 days. The three motorships on the service stay exactly one day in Durban, but the steamers, presumably for bunkering purposes, are compelled to stay for 3 days. Cape Town is the next port of call and after leaving here the ships run a South Atlantic leg to Santos, Brazil, which is reached 10 days after leaving the Cape. Santos, Rio de Janeiro and Buenos Aires are all touched at for cargo discharge purposes and the latter port is officially the terminal of the outward portion of the voyage. The vessels stay here loading and unloading for about 10 days and then proceed to Santos and Rio de Janeiro for coffee cargoes, which they run straight up to New Orleans. American cargo is loaded at New Orleans, Galveston and Los Angeles, which is the last port of call before Yokohama. These motorships by their superior speed and efficiency can deliver coffee at New Orleans in record time and have made serious inroads on the steamer business in this trade.



O.S.K. Cargo Fleet



Route Diagram for Round the World Passenger-Cargo Fleet

Shows 18 ports of call from Kobe back to Kobe and Denotes times and speeds on main "legs"

CHARACTERISTICS OF MS. "MONTEVIDEO MARU"

Length overall	448-ft. 9-in.
Beam molded	56-ft. 0-in.
Depth molded to shelter deck	36-ft. 0-in.
Draft load	25-ft. 0-in.
Displacement at above	12,184 tons
Gross tonnage	7,267 tons
Net tonnage	4,386 tons
Deadweight capacity	6,800 tons
Service speed	about 14 knots
Number of tiers 'tween decks	2
First-class passengers	40
Second-class passengers	102
Steerage passengers	688
Power, main engine	4,600 b.hp.
Speed, main engine	112 r.p.m.

Seventeen days are taken to cross the Pacific to Yokohama and from this port the vessels proceed on to Kobe, thus completing the round trip. A voyage such as this demands the best of ships and the most reliable of engines. There are long cross-ocean legs and variations in climate, in temperature, and in weather.

Ms. Montevideo Maru and her two sisters can make, if necessary, between 15 and 16 knots and for that reason they rank among the fastest motorships in the world. They run at 14 knots between the Cape and Santos because their passenger list is then fullest, and between Santos and New Orleans on account of the coffee trade. Accommodations are provided for 40 first-class, 102 second and 688 immigrant passengers. In fact, it was the immigrant trade between Japan and South America which largely influenced the construction of the ships. Structurally the vessels are of shelter deck type with a short topgallant forecastle. A bridge house amidships accommodates first-class passengers on the bridge deck and on the promenade deck in comfortable two-berth cabins.

Propulsion is effected by two 6-cylinder Mitsubishi-

(Continued on page 278).

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*Motorship.

Broadcasting in Japan*

By R. E. A. Putnam, Engineering Department, Nippon Electric Co., Ltd.

JAPAN, like other countries, has undertaken the task of working out in its own way the solution to the problem which was suddenly thrust upon it by the recent popular demand for radio entertainment. The idea of permitting private interests to control broadcasting services for advertising purposes or for political reasons has never been given serious consideration, in spite of the pressure brought to bear upon the Government by numerous applications for broadcasting licenses from large business concerns and influential newspapers in Japan. It is worthy of note that the potential value of this new medium as an educational factor in the life of the nation gained early recognition, and it is the conception which was consistently advanced and eventually adopted as the basic principle underlying present day service.

Many difficulties of a perplexing nature were naturally encountered in attempting to guide the radio broadcasitng industry into a well defined channel, rather than permit it to develop and expand along the lines of least resistance. Foremost among these was the question as to whether the new industry should be maintained as a Government monopoly, or whether its operation and management should be entrusted to private interests. After some delay the Government announced that the latter solution would be adopted. This policy was undoubtedly influenced partly by the necessity of concentrating all the Government departments on the work of reconstruction of communication facilities which had just previously been impaired seriously by the 1923 earthquake and fire, and partly by the realization that a service devoted to the interests of the people should not be dependent, especially during the early period of growth and expansion, upon the political fortunes of its management.

Association Formed

Following closely the announcement of the Government's policy, representatives of the larger business concerns in Tokyo interested in advancement of the raido industry arranged a series of meetings which culminated in the formation of a non-profit-earning corporation known as the Tokyo Broadcasting Association. Sufficient capital was subscribed by the members to finance the corporation's preliminary programme; and negotiations conducted with the Government were successful to the extent that the Association was granted the exclusive right to operate a local broadcasting station and to maintain this service by monthly fees collected from licensed radio receiving sets in Tokyo and vicinity included within a radius of approximately 160 kilometers. The Government in turn insisted on the Association's agreement to certain provisions and stipulations which insured to itself some measure of control of the broadcasting problem and the Association's activities.

The Tokyo Broadcasting Association's agreement with the Government furnished a definite basis for further negotiations by local organizations in other parts of the country. However, it was only in the Osaka and Nagoya districts that negotiations were successful; the organizations in the remaining four districts of the Empire failed either in their efforts to obtain the necessary financial support, or to satisfy the Government as to their respective abilities to fulfill obligations to the public.

At a time when negotiations between the Government and the local broadcasting organizations were still pending, elaborate plans were being prepared and carried out by co-operation of members of the electrical industry for the express purpose of stimulating public interest in broadcasting. In Tokyo these plans led to the operating of a radio exposition in the fall of 1924 at which time samples of the radio products of Japan, together with those of other countries, were suitably displayed.

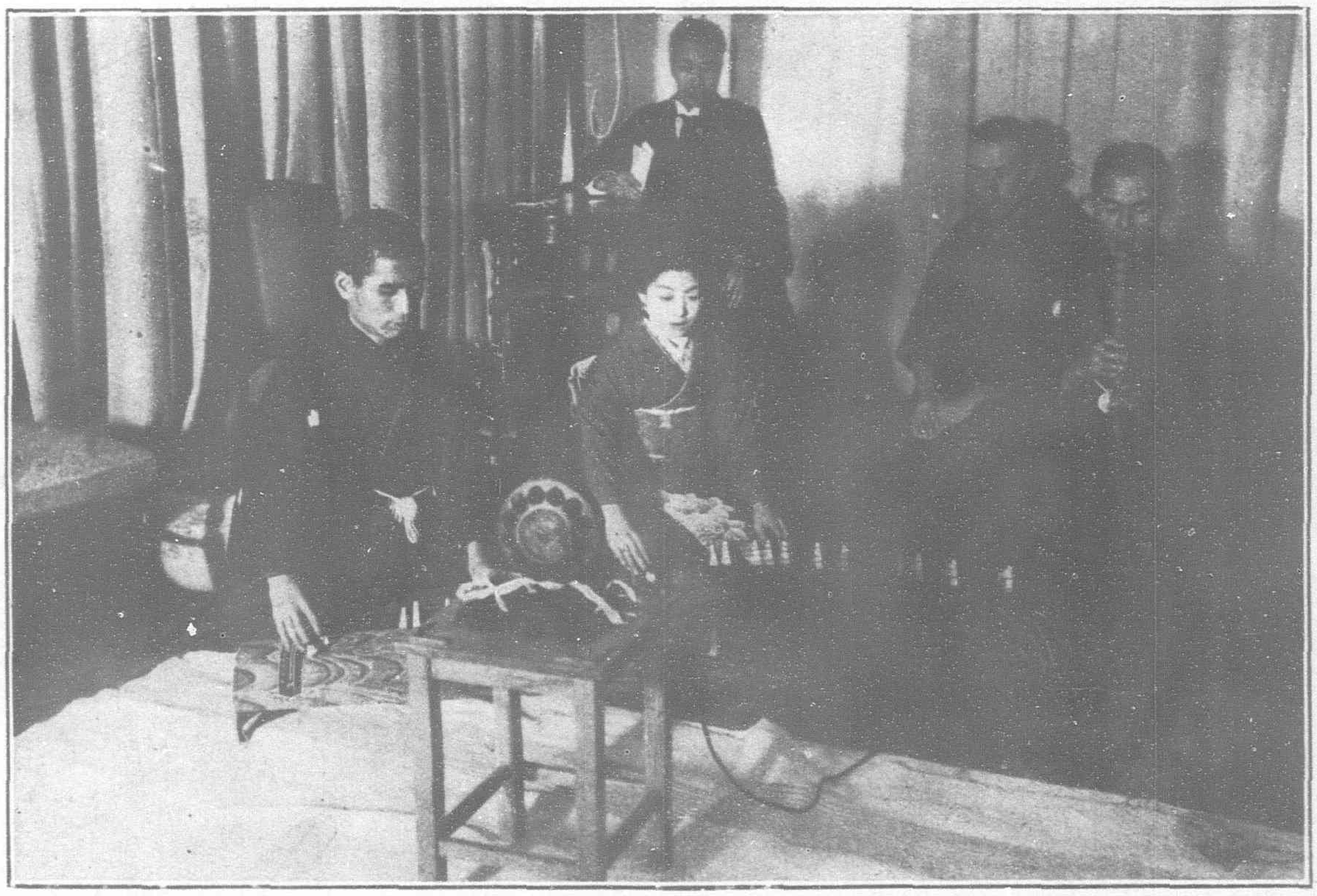
First Broadcasting

The Nippon Electric Company took a leading part in this programme and was fortunate in having been able to display at the exposition a Western Electric No. 101-B, 500-watt radio telephone broadcasting equipment which had just been received from America. This equipment was loaned to the exposition management under whose auspices it was operated for a period of three weeks at reduced output by special arrangement with the Government. Regular programmes were provided from a temporary studio on the exposition grounds.

In the early part of 1925 the broadcasting set was used under somewhat similar arrangements at Osaka where it was permitted to operate for a period of three weeks at one-half its rated output capacity.

Unexpected Growth

These demonstrations gave the public its first taste of modern broadcasting, and the response indicated a degree of enthusiasm exceeding all expectations. With this experience as a background, the newly organized broadcasting association were enabled to complete their negotiation with



The Broadcasting of Japanese Music over the Radio has been A Great Success, as It has been found that It is much easier to transmit this Form of Music without Distortion than Foreign Music, which has Greater Complexity.

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*The Oriental Engineer, May, 1927.

the Government, and to make plans for the immediate establishment of permanent broadcasting stations with the assurance that their venture would not prove to be a failure.

Radio broadcasting was begun regularly in Japan about the middle of 1925. The degree of success attained is best indicated by the fact that this service gained immediate popularity, rivalling this previously experienced in other countries. The growth in the number of radio receiving sets greatly exceeded the original estimates of the promoters, and at the end of the first year of operation the total number of subscribers to the three broadcasting stations was approximately 280,000. New subscribers are now being added at a rate which indicates that the 400,000 mark will be exceeded this year.

At the present time any person desiring to operate a radio receiving set must first become a subscriber to the broadcasting service in the district in which he resides. An application to this effect must include a general description specifying the type of circuit and wave-length range of the radio receiving set which it is proposed to use. Although this application is filed with the local broadcasting company, the actual licensing of the applicant is a Government function, and the application is not accepted untill the Government examiners are satisfied that the receiving set will comply with their official regulations. In general, licenses are granted on all types of receiving sets which appear to be incapable of radiating energy or of being tuned above 600 meters wave-length.

Monthly Fee

The entire cost of the broadcasting service is borne by the subscribers who pay a monthly fee of one yen each to the local broadcasting association, and an additional yearly fee of one yen to the Government. The latter item is intended to cover the Government's expenses incurred in examining applications for receiving set licenses, and in making periodical inspections to insure that all receiving set installations comply with existing regulations.

The Tokyo Broadcasting Association officially started its service in the spring of 1925 at a temporary station using a 500 watt point-to-point radio transmitter borrowed from the Electrotechnical Laboratory of the Tokyo Municipality. This service was maintained for about three months pending the arrival of a 1,000 watt Western Electric broadcasting set and the construction of a premanent station.

Station JOAK

The site selected for the new station was on the top of Atago Hill, a low-lying but principal business district of Tokyo including Tokyo Bay. When first acquired by the Association this location was a bare and desolate site as a result of the fire following the earthquake of 1923. The original means of ascent was by long flights of stone steps, and all construction material and equipment for the station had to be transported to the top using a derrick specially erected for the purpose. Later, at considerable expense, a motor road was completed to the summit for the convenience of the operating staff and visitors.

The new station began operation in July, 1925, on a 375 meter wave-length with the call letters JOAK. Designed with the idea of eliminating all possible risks of interruptions to service, the building housing the radio equipment, studios and general offices is of reinforced concrete and virtually fire and earthquake proof. With power service supplied from too independent sources, two complete broadcasting equipments, and an emergency storage battery capacity capable of operating the entire station for 10 hours, it is felt that the installation would prove most useful in the event of a repetition of the 1923 earthquake with consequent destruction of all wire communication facilities.

One of the two broadcasting sets is the Western Electric No. 106-A set rated at 1,000 watts antenna input power, and the other is a product of local manufacturers, having a somewhat lower power output. The former is depended upon for the transmission of all important programmes, and the latter is reserved principally for use in emergencies. Installed side by side, the difference in space requirements of the two radio transmitter designs is one of the first points noted by visitors in their comparison of equipment. Whereas the Western Electric transmitter is contained within or controlled from one panel only, the other raido transmitter has its control and equipment distributed over five panels of equivalent size.

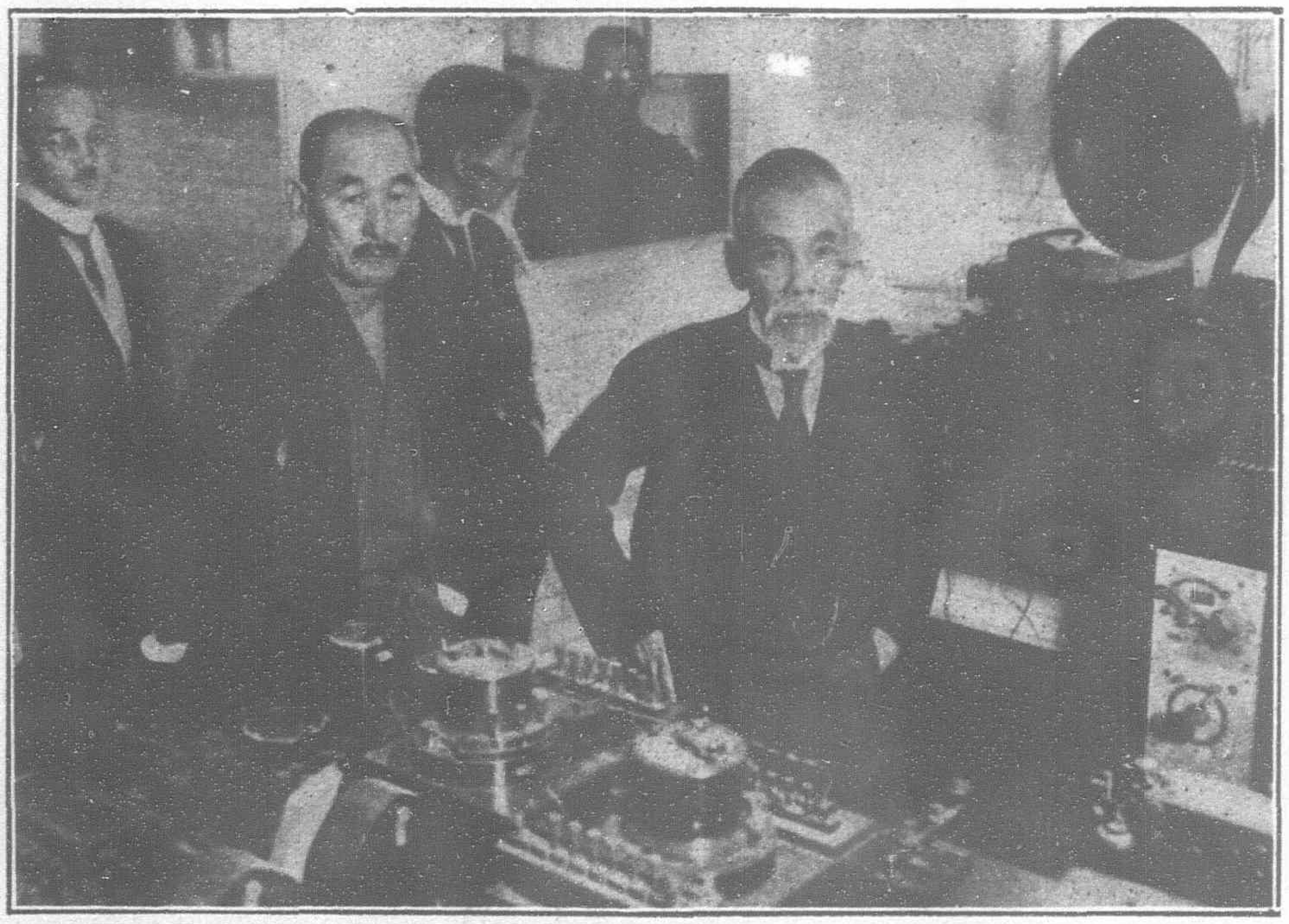
Modern Set

The No. 106-A radio broadcasting set is similar in many respects to the 500 watt set used in the Birmingham Broadcasting Station. Speech amplifiers, microphones and studio signalling apparatus are fundamentally the same. The power panel, however, is eliminated, and the motor-generator controls are on the transmitter panel instead. In the radio transmitter another difference exists in that only one oscillator and one modulator tube are used instead of two tubes; and that a stage of radio frequency amplification employing a water-cooled tube is added between the oscillator-modulator combination and the antenna. The principal advangate of this new arrangement is that the oscillator frequency is practically independent of the antenna capacity so that the wave-length of the radiated carrier will not vary as does that of the ordinary transmitter when the antenna sways in the wind.

Automatic Control

From the standpoint of operation the 106-A broadcasting set is especially easy to control and adjust. The power equipment is remotely controlled from the radio transmitter panel by means of a master star-stop switch, and any necessary voltage adjustments can be made from the same panel. Adequate protection to the apparatus is provided by fuse and relay equipment designed to interrupt automatically the power supply in case of failure of the cooling water supply, or the existence of other abnormal conditions. Other relay combinations are provided to insure that the various power supplies to the vacuum tubes are applied or removed only in the proper sequence. In general, one operator is able normally to start up the set, make any necessary adjustments at the radio transmitter or speech input equipment and have the entire equipment ready for broadcasting within one half minute.

Protection to the operator is assured by complete shielding of high voltage circuits, and by the provision of door switches which automatically shut down all power equipment in case the operator fails to take this precaution before



Mr. Inukai, late Minister of Communications, Listening to the Broadcasting Program at the Museum attached to his Department.

exposing the high voltage apparatus and power terminals inside the transmitter panel.

The power equipment consists of two 3-unit motor-generator sets. One set furnishes direct current at 22 volts for the vacuum tube filaments, and a 250 volt supply for various control circuits and grid biasing purposes. The second set includes two 2,000 volt generators with armatures in series to provide the 4,000 volt, supply to the plate of the water-cooled tube.

Reaches America

The antenna used with this station is of the flat-top type, with an effective length of about 20 meters, suspended between two self-supporting steel towers approximately 50 meters in height. With this is used an insulated counterpoise supported on the roof of the building housing the studios and transmitter equipment. Frequent reports of the reception of this station at points in Australasia and on the North American Continent indicate that the antenna system is quite efficient.

The studio arrangement in the Tokyo station is typical of that being adopted in Japan. It differs somewhat from European and American practice in that provision must be made for certain types of musical programmes in which the artistis are accustomed to sing and to play their musical instruments while in a sitting position on the floor. Accordingly, a special studio is provided for this purpose, duplicating as far as possible the usual features of construction to be found in a typical Japanese home. A second studio furnished in foreign style is used for the presentation of band selections, orchestral numbers and radio dramas. A third studio of small proportions is reserved for speeches and special announcements as occasion requires. A small control room is so located that the control operators have a direct view of the activities in all three studios.

Osaka Station

The Osaka Broadcasting Association acquired the Western Electric No. 101-B broadcasting set following its successful demonstration in Osaka, and arranged for its immediate installation in temporary quarters on the roof of an eight-story steel and concerte structure in the heart of the city. Although the Government's final regulations specified 1,000 watts as the required antenna input power, it granted the Osaka Association a license to use its temporary installation pending the construction of a permanent station, and assigned it the call letters JOBK and an operating wave- length of 385 meters. This temporary station was officially opened on June 1, 1925, and at the moment of writing is still in operation, owing to legal and technical difficulties encountered in securing a suitable site for a permanent station. According to present plans, however, a new station employing a Western Electric No. 106-A broadcasting equipment will be in operation this year.

It is worthy of note that the existing 500 watt equipment has been in operation for more than 15 months without experiencing a major breakdown, and that no serious interruptions occurred which might be attributed to design or equipment defects. This equipment, except for slight modifications and improvements, is identical with that previously described. It may be mentioned in this connection that reliability of operation is considered of primary importance, and that an operating license is granted only after the Government's engineers have made exhaustive tests covering the installation, and have satisfied themselves that it complies in all respects with approved standards.

Nagoya Station

The Nagoya Broadcasting Company opened its permanent station in July, 1925, with the call letters JOCK and an operating wave-length of 360 meters. A broadcasting equipment imported from England is installed here and is operating with 1,000 watts input to the antenna.

In connection with the early history of radio broadcasting development there are certain aspects of the Government's policy in handling the radio receiving set problem that are worthy of mention. As in many European countries, the prospect of a widespread use of receiving sets by private citizens was viewed with alarm by military authorities and other Government departments operating radio telegraph communication facilities; and it was freely predicted that constant trouble would be experienced from unauthorized interception of important commercial and Governmental messages.

Government Control

As early as 1923 imported receiving sets began to appear in the local market, and these secured a limited distribution among amateur experimenters. Some of these incorporating the long-wave tuning circuits were particularly objectionable from the above-mentioned viewpoint; and in addition the majority of vacuum tube sets employed the simple regenerative circuits which were known to be causing serious interference in America. In an attempt to cope with this situation by discouraging the sale of such apparatus, the Government promulgated a set of regulations specifying the technical characteristics that would be required of radio transmitters and receiving sets before an operating license could be granted. These regulations were at the same time, a virtual announcement of the Government's intention eventually to permit radio broadcasting; and they constituted the first comprehensive effort to establish a basis for the growth of the industry without permitting it to get beyond control.

Under this plan the public was to be protected from unscrupulous manufacturers by the requirement that the individual items entering into a radio receiving set installation should include only products specifically approved by the Government laboratories. This applied to the receiving set proper, and all accessory items such as vacuum tubes, headphones, auxiliary amplifiers and loudspeakers. The receiving set itself was to be capable of being tuned to signals in either of the two broadcasting wave-length bands, namely, 200-250 meters and 350-400 meters, but incapable of being tuned outside these ranges. Furthermore, sets were not to be approved if they were arranged so that external circuit modifications could be devised to change the tuning range, or cause regeneration. With an additional provision for limiting the dimensions of the receiving antenna, and a further requirement that the set be sealed by a Government inspector to prevent circuit modifications, it was felt that no further objections would be raised to the general use of radio sets by private citizens.

Difficulties

Although ideal in many respects, these regulations were found to possess certain disadvantages in practice. In 1924 when plans for broadcasting began to take definite form, manufacturers undertook to supply approved receiving equipment to meet the growing popular demand. However, only a few manufacturers were able to build receiving sets covering satisfactorily the specified wave-length ranges, and those who succeeded found their product comparatively inefficient and quite expensive. Again, dealers handling approved receiving equipment sometimes found their stocks of receiving sets temporarily unsalable owing to real or apparent scarcity of approved accessories such as headphones or vacuum tubes. The general public gradually became aware of the fact that simple and inexpensive crystal detector circuits using unapproved apparatus could be easily assembled to give about the same efficiency as equivalent approved factory-made sets, and small dealers handling unapproved apparatus accordingly grew rapidly in number.

Self Made Sets

When applications for receiving set licenses in Tokyo alone began to flow in at the rate of about 300 per day following the opening of regular broadcasting service, it became evident that the majority of receiving set owners were assembling their own sets. Appreciating the difficulties involved in attempting to maintain the existing regulations and at that same time develop a self-supporting broadcasting service, the Government decided in favor of the latter policy and forthwith undertook to encourage the use of home constructed sets by making it especially easy for their owners to obtain operating licenses. This action indirectly legalized the use of the majority of expensive imported sets that had previously secured wide distribution, and incidentally relieved many local dealers of serious financial embarrassment that would otherwise have existed by reason of their inability to dispose of their extensive stocks of imported sets.

Serious Programs

Broadcasting service in Japan is probably taken more seriously than in the majority of countries. This is readily apparent from the fact that amusement features constitute only about one-third of the daily program which averages perhaps eight hours total. The remainder of the program is made up of items which might be broadly classified either as educational or as news. A typical daily program, for example, may begin at nine o'clock in the morning with a lecture on domestic science followed by talks on other subjects of general interest, and a noon hour program either musical or educational in nature. During the late afternoon and early evening a brief period usually is devoted to features of interest to children. During these hours lectures following some prearranged schedule are usually also given on foreign languages for the benefit of students. The study of English probably receives the greatest amount of attention, with French and German next in importance. The evening program from 8 : 00 to 10 : 00 p.m. is almost exclusively reserved for musical programs and radio dramas. In addition, weather forecasts are given at least twice daily and important news items are contributed at intervals by local newspapers.

One of the most useful services performed is the broadcasting of market reports on securities and commodities. These reports are sent out about once every hour throughout the working part of the day, and are said to form the basis for a considerable share of business transacted at points remote from the large cities, especially in those communities where telephone and telegraph facilities are scarce and long distance communications are subject to considerable delay in transmission during the busy hours of the day.

Western Music

Among the musical programes provided are usually to be found three or four periods a week devoted to foreign music rendered by Japanese artists. Foreign artists of note residing or travelling in the country are also engaged for one or more studio performances when practicable. This represents an effort on the part of the program managers to interest foreign residents in Japan, and at the same time to meet a growing demand on the part of Japanese listeners who appear to enjoy and appreciate this type of music.

As a result of observations made during the first year of operation, some unexpected tendencies in the growth of the broadcasting industry are now in evidence. First in importance is the fact that the public response to the broadcasting appeal is considerably different in various localities. For example the program service furnished by the Tokyo, Osaka and Nagoya stations has been of about the same standard, yet at the end of the first year of operation the subscribers to these stations numbered approximately 160,000, 80,000 and 40,000, respectively. These figures are not representative of the comparative populations involved.

A second consideration of interest, based on an analysis of the existing types of receiving sets in use, is the fact that more than 80 per cent. of the licensed sets are of the crystal detector type. There is also evidence to indicate that the great majority of crystal sets have been constructed by their owners.

Fading Reception

A third observation is to the effect that radio transmission over distances in excess of about 50 kilometers is notably unreliable for the assigned broadcasting wave-lengths. The high atmospheric absorption and resultant fading effect experienced probably is a characteristic of the country, the interior portions of which are generally mountainous. Consequently, a number of important communities, which were thought to lie easily within the range of one of the three existing broadcasting stations, have found reception entirely unsatisfactory.

As these facts have gradually become evident, the officials in charge of broadcasting have been led to the conclusions that the majority of small communities will be unable to support a local station under existing arrangements if the expense of providing programs is included. It has become obvious also that successful plans for a nation-wide service must be based on the general use of crystal detector receiving sets.

Recently, negotiations have been conducted between the three broadcasting companies and the Government with the intention of reorganizing the industry so as more effectively to conduct an enlarged program for expansion. These negotiations have resulted in the formation of the Japan Broadcasting Corporation, which essentially is a holding company authorized to acquire the stock of the three existing local organizations and to pool the earnings for establishing supplementary services throughout the Empire.

Better Equipment

Although the future plans of the new Corporation have not as yet been made public, it is probable that they will provide for the eventual replacement of the existing stations by higher power equipments, and for the establishment of several additional equipments of uniform size in other communities. Smaller isolated communities possibly will be covered by the use of low power relay stations inter-connected by wire lines with centralized studios in the larger cities.

Financing

At the present time the broadcasting art has progressed to a point where no technical difficulties are likely to be encountered in operating or interconnecting any desired number of broadcasting stations distributed over wide areas. The principal problem involved is, therefore, one of financing, and on the solution of this problem depends the time required by the new corporation to achieve its purpose and extend its service to all crystal receiving sets within the Empire. Certainly, the importance to the nation of the ultimate realization of present plans for an unified and comprehensive broadcasting service is scarcely to be over-estimated; and it seems safe to say that from an educational standpoint alone the potential possibilities inherent in such a service are not to be equalled by any other medium.

Round the World Passenger-Cargo Fleet

(Continued from page 274).

Sulzer Diesels. These engines were constructed entirely in Japan, while those of the two sister vessels, *Santos Maru* and *La Plata Maru*, were built at Sulzer Bros. works in Switzerland and shipped out to the shipyard. In all three ships, however, the engines are the same, and have a total power of 4,600 b.hp. which is developed at 112 r.p.m.

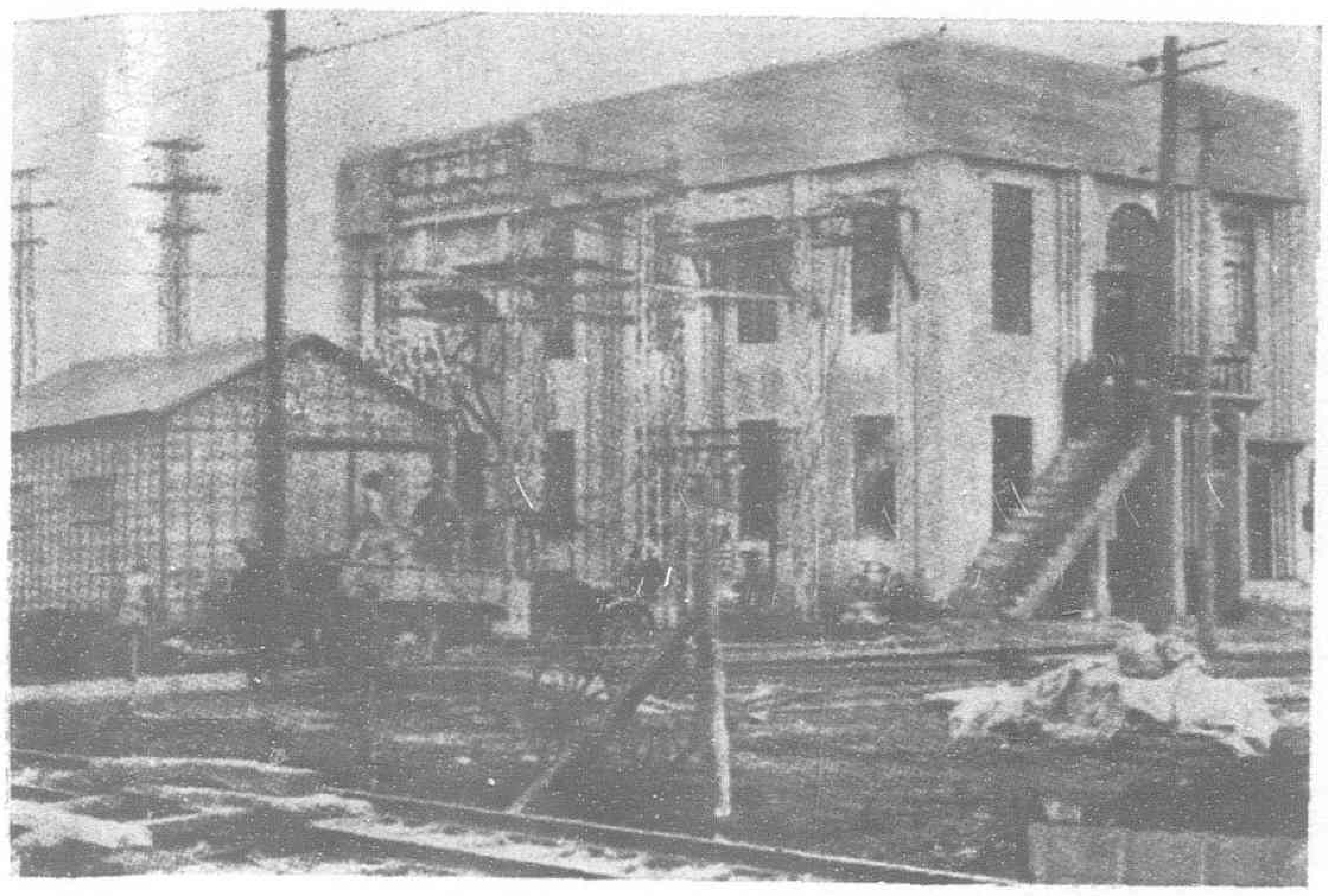
Scavenge air is supplied by two electrical driven blowers, each running at about 2,500 r.p.m. Each main engine drives its own injection compressor from a forward extension of the crankshaft.

The main engines are arranged in a compact machinery space slightly abaft amidships. There are in all three auxiliary Diesel generator sets, each driven by a 250 b.hp. Sulzer engine. These are of 150 kw. output and are arranged two on the port side and one on the starboard side of the main engines. The usual pumps are arranged in the engine-room wing. Some of these are of Sulzer Bros. make, while others are of Weir & Drysdale manufacture. Centrifugal purifiers are used for both fuel oil and lubricating oil, and these are all of De Laval type. An auxiliary boiler is used for heating the ship and fuel tanks.

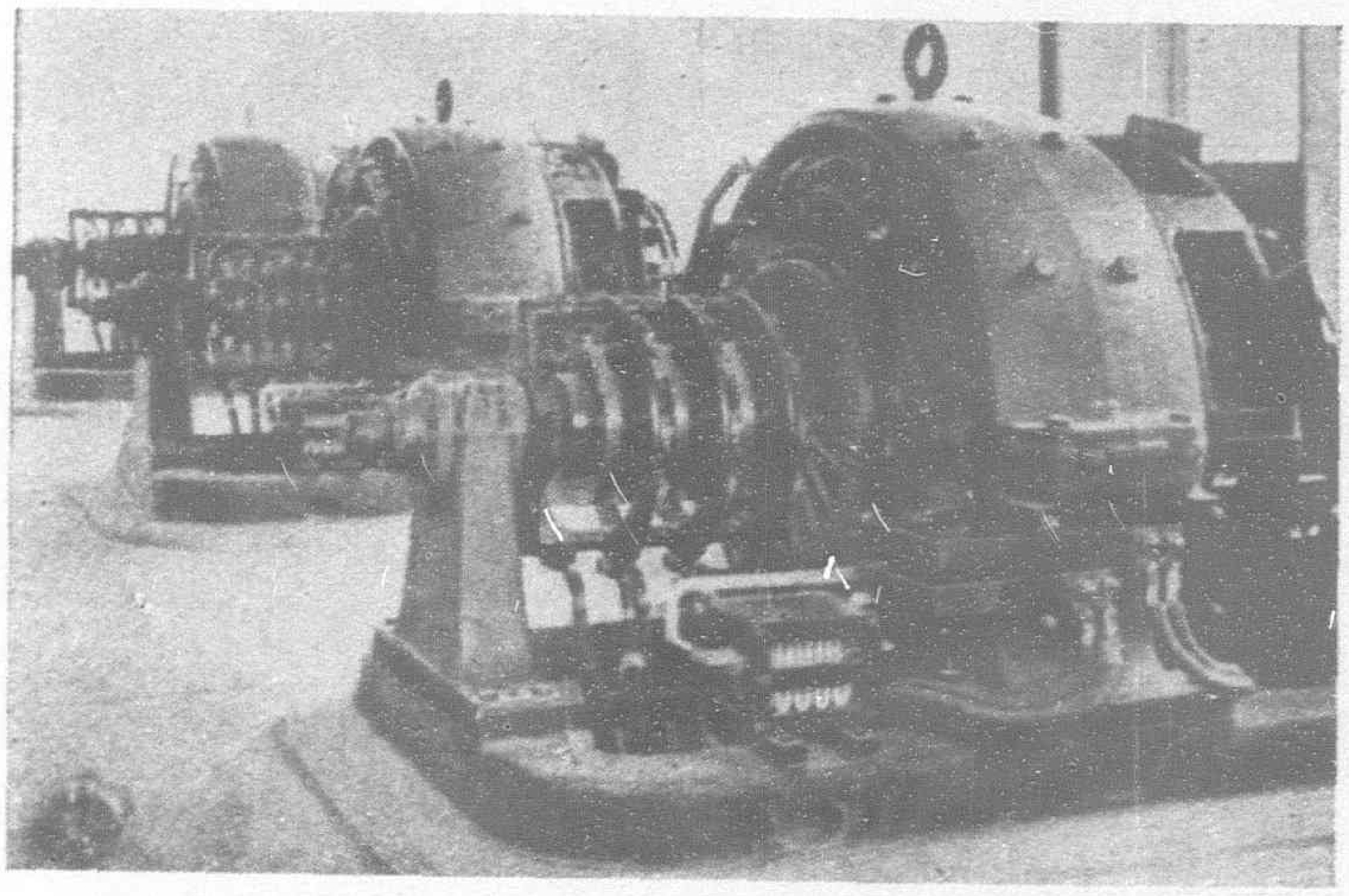
Montevideo Maru and her two sister ships are remarkably fine vessels. They are among the fastest motorvessels in the world and the service upon which they are engaged is a particularly arduous one. The owners must certainly be congratulated upon their realization of the potentialities of Diesel powered intermediate passenger and freight ships for a service such as this, and the fact that more ships are contemplated for the service seems to indicate that they are well satisfied with their choice.

Japan has been later than many other nations in her adoption of the motorship, but recent construction indicates that, although tardy, her interest in Diesel propulsion is nevertheless keen.

On her last arrival at Sydney, N. S. W. the big transpacific motorliner *Aorangi* had then run 201,042 miles in 2 years and 8 days since leaving Southampton, England, on her maiden trip. It is understood she is laying off for one trip on her arrival at Sydney because it is the slack season for traffic and a smaller boat can take the run just as well. It is rumored that the company is altering some of the staterooms, making them larger, and it may be that this will be undertaken now.



Isehara Sub-Station



Revolving Converters Equipped in Isehara Sub-Station

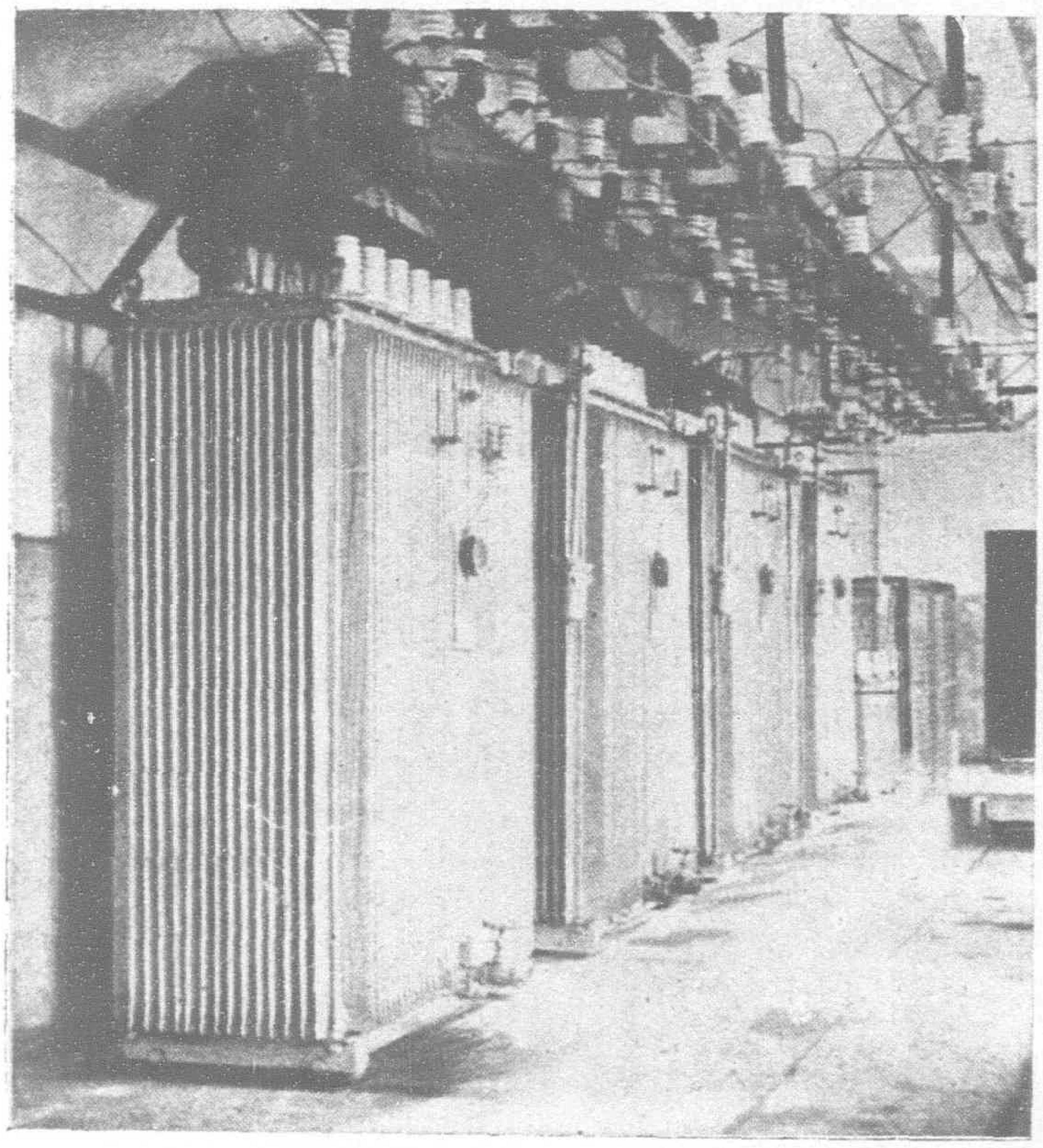
The Odawara Express Railway

THE construction of Odawara Express Railway running between Shinjuku, Tokyo and Odawara, Kanagawa Prefecture has been recently completed and the actual service was commenced on April, 1.

The mileage of this line is 52 miles or 84 kilometers, which is the longest of all the privately operated suburban electric railways in this country. With the appearance of this railway, it became possible to cover the section in a short time of only one and a half hour. There are 36 stopping-places between Shinjuku and Odawara.

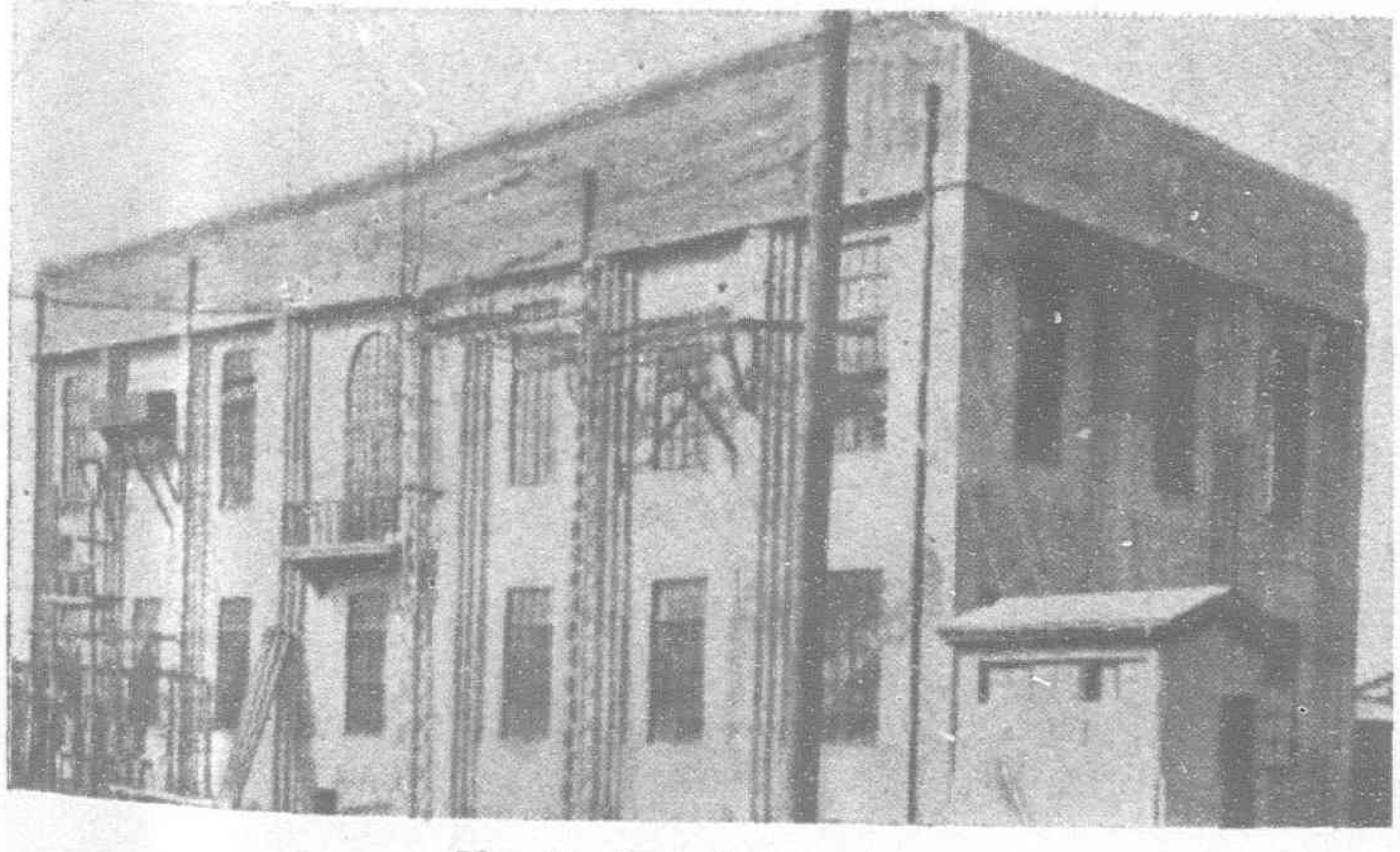
Single catenary overhead trolley working on 1,500 volt D.C. is adopted for the whole line. The complete equipments such as cars, sub-station installments, towers and bridges have been manufactured or constructed by Mitsubishi.

There are two classes of cars, namely, A. and B. "A" class car has an accommodation for 100 passengers. This car which has a 3 feet 6 inches gauge is 16 metres in length, 3.7 metres in height and 2.7 metres in width. It is a semi-steel bogie equipped with AMM control pipe system air brake and a 4 by 72 h.p. motor. The length of "B" class car is 15.1 metres with same height and width as those of the A class one. With the exception of the length and the motor provided which is of 4 by 110 h.p., other installations are same as those of A class.

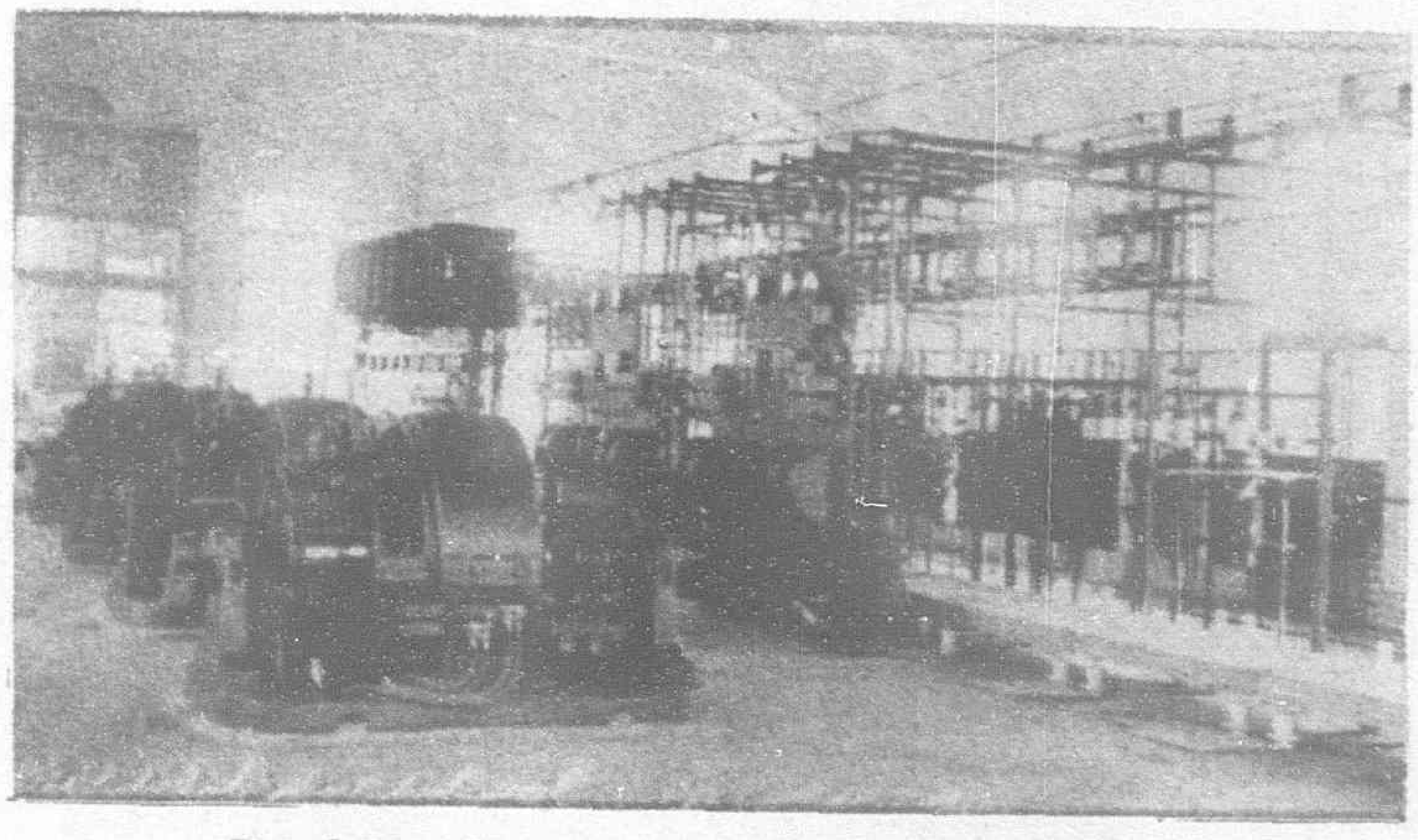


Transformers Equipped in Kyodo Sub-Station

There are four sub-stations along the line. They are Kyodo, Zama, Isehara and Matsuda. Among other things, 4 sets of 525 KVA transformer, 1 set of 20 KVA transformer for signal and 4 sets of 500 KW. 750 V. revolving converter are installed in Kyodo Sub-station, while Isehara Sub-station is provided with 3 sets of 500 KW. 750 V.

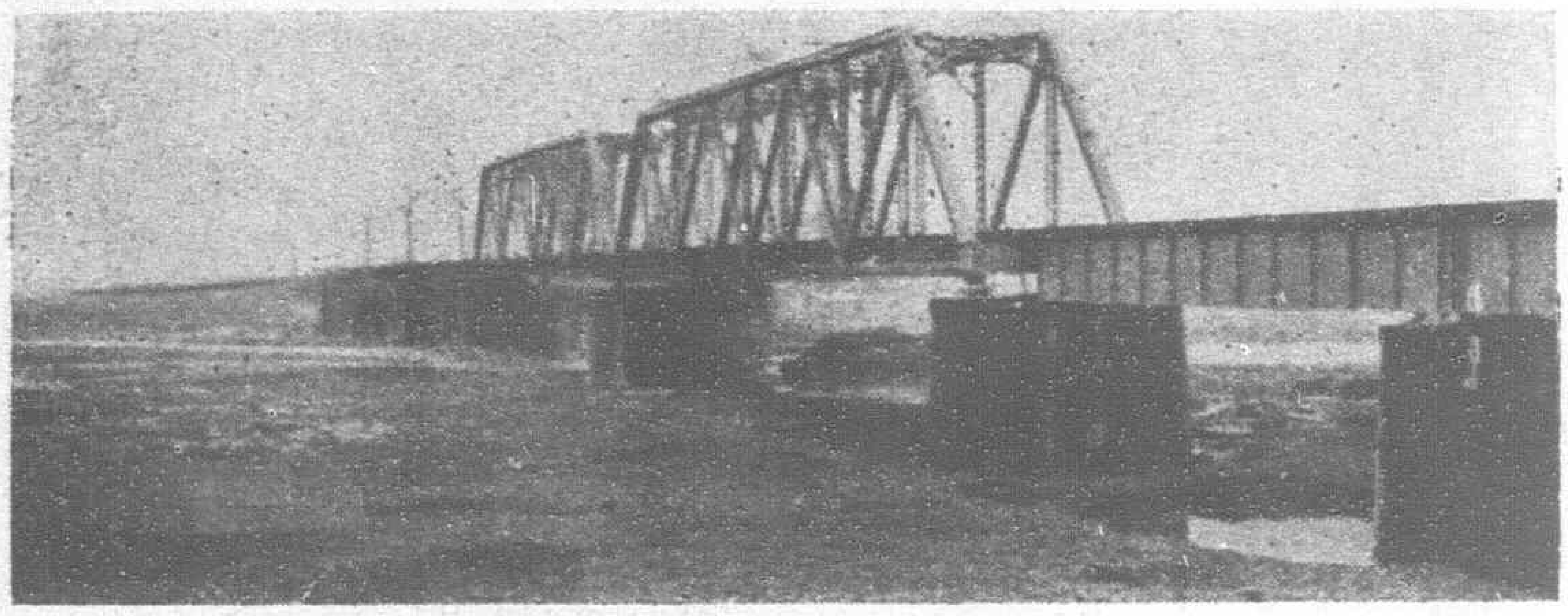


Kyodo Sub-Station

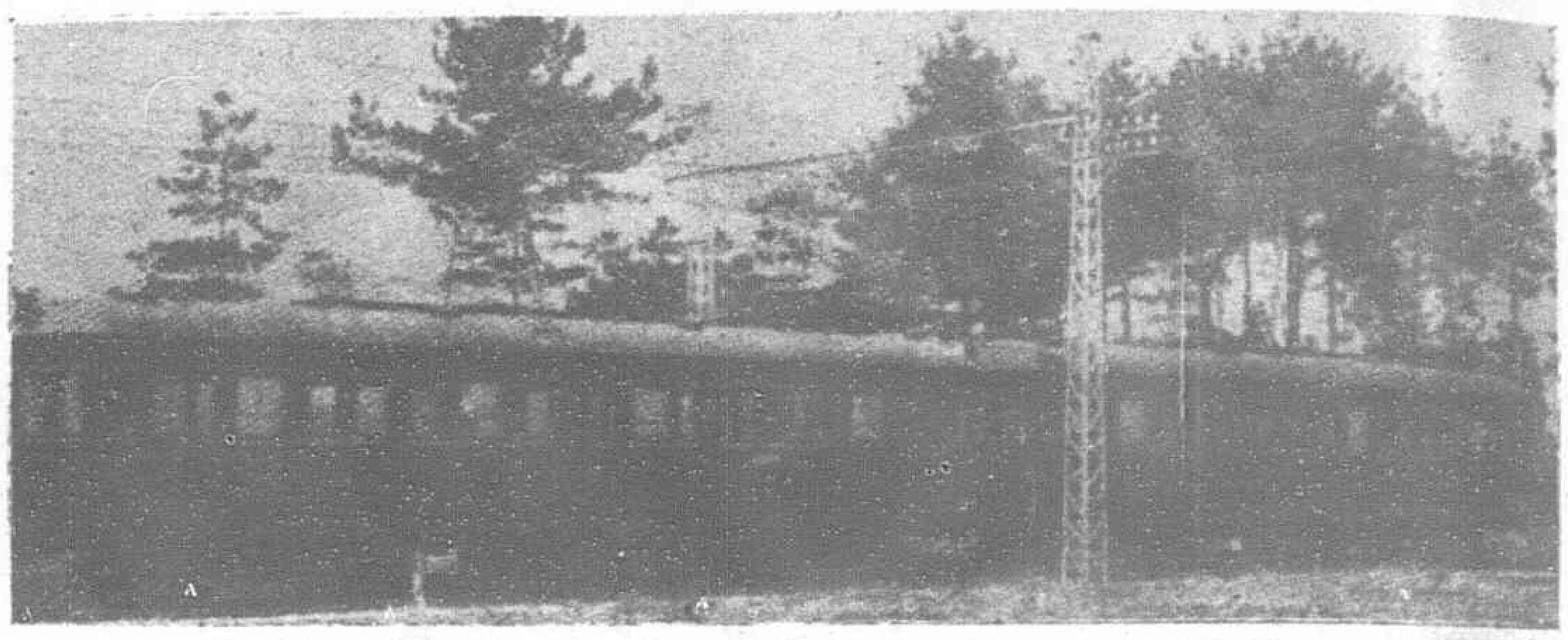


Revolving Converters in Kyodo Sub-Station revolving converter. These transformers and other electrical equipments have been manufactured by Mitsubishi Electric Manufacturing Company.

The Sakawa-Gawa iron bridge, one of the longest bridges on the line has been designed and constructed by Mitsubishi Shipbuilding Company.



Sakawa-Gawa Iron Bridge



A Car Used on the Odawara Express Railway

The New N. Y. K. Motor-Driven Vessels

THE N. Y. K. Line has now decided on the plan of the three motor-driven vessels of 16,500 gross tons each for their trans-Pacific service, and the orders for the two motorships, fitted with Sulzer quadruplescrew Main Engines, will shortly be placed with the Mitsubishi Shipbuilding Yard at Nagasaki, while the ship with the B. & W. Twinscrew Main Engines will be built at the Kawasaki Shipbuilding Yard at Kobe.

The new vessels will embody the latest ideals in Ship Construction, and on their completion in 1929, are expected to bring about a new era in the trans-Pacific passenger traffic. Of the passenger accommodation, the following outstanding features may will be considered as being worthy of mention.

1.—All first and 2nd class state-rooms have access to direct open air portholes, or rather windows.

2.—The per capital space for passenger is equal to that in any trans-Atlantic steamers.

3.—All 1st class state-rooms are fitted with large size beds and not with berths. A limited number of the state-rooms however, are fitted with an additional pullman berth for the accommodation of a family with children. A perfect system of hot and cold running water supply is installed in these vessels.

4.—To eliminate to the last degree the ship's vibration and rolling, special attention has been paid to this in the construction of the ship, even at great sacrifice. The following are further details of the engines, with which these motor ships are to be fitted.

TWO VESSELS TO BE BUILT AT NAGASAKI.

Main Engine :—*Manufacture* : Sulzer Brothers Ltd., Switzerland, *Type* : Sulzer. *Number of Engines* : 4 sets. *Number of Cylinders* : 8 (each engine). *Diameter of Cylinder* : 680 M.M. *Stroke* : 1,000 M.M. *Rotation per Minute* : 120. *Horse Power* : 20,000 (Total)

Air Compressor :—Stage type ; connected with the forepart of the Main Engine.

Electric Generating Set :—Allen & Co., England. B. & W. type 4 cylinder Diesel Engine, 4 sets : Rotation 250 per minute, 450 k.w. per engine, voltage 220 volts.

Donkey Boiler :—Scotch type Marine Boiler, 2 sets : diameter 11 ft., length 10 ft., pressure 120 lbs.

Auxiliary Engines :—Motor-driven.

ONE VESSEL TO BE BUILT BY KAWASAKI YARD.

Main Engine :—*Manufacturer* : Burmeister and Wain Ltd., Copenhagen. *Type* : B. & W. Double acting 4 cycle Diesel Engine. *Number of Engines* : 2 sets. *Number of Cylinders* : 8. *Diameter of Cylinder* : 840 M.M. *Stroke* : 1,500 M.M. *Rotation* : 115 per minute. *Horse Power* : 20,000 (Total).

Air Compressor : Stage Type Independent B. & W. 4 cycle Diesel Engine, horse power 850 each, 3 sets.

Electric Generating Set :—B. & W. 4 cycle Diesel Engine 3 sets : Rotation 250 per minute, each engine 400 k.m., Voltage 220 volts.

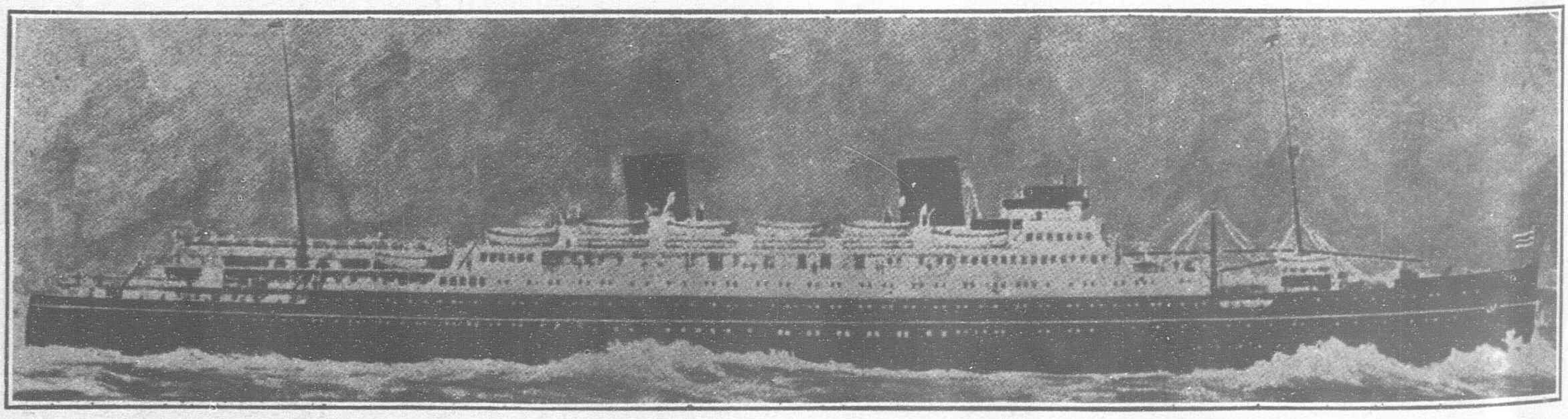
Donkey Boiler :—Scotch type Marine Boiler 2 sets : Diameter 2 ft. 3 in., length 8½ ft., Pressure 120 lbs.

Auxiliary Engines :—Motor-driven.

From the above one will note that the new vessels with the Sulzer Engines will surpass the largest internal combustion vessel in the world viz., the "Aorangi" (15,000 h.p.) in point of her horse power ; while our vessel, with Burmeister and Wain Engines, is by no means inferior to the world's largest motor-driven vessel the "Asturias" (20,000 h.p.).

Gross tonnage : 16,500 tons. Length, over all : 584 ft. Breadth, moulded : 72 ft. Loaded draft : 28 ft. 6 in.

Passenger accommodation : 1st class, 200. 2nd class, 100. 3rd class, 500.



Nippon Yusen Kaisha will Commission in 1928 Three Quadruple-screw Motor-driven Liners for its California-Orient Service. The above is the Naval Architect's and Artist's conception of the New Ships. N.Y.K. Directors have Authorized a $15,000,000 Expenditure for the Ships

Engineering Notes

New Power Company.—The Tobo Electric Company has decided to establish the Tenryugawa Generating Service Company by the end of next month.

Direct Railroad Communication, Berlin-Peking.—For the first time since 1914 through railroad tickets will be sold on May 15, 1927, from Berlin to Tokyo, Peking, and Shanghai, provided the home governments ratify the work of their delegates in Berlin, as expected. A ticket second class from Berlin to Tokyo will cost 650 marks, exclusive of sleeper. The actual distance from Germany to Japan is 12,000 kilometers, and the time required will be 11 days to Peking and 12 days to Tokyo. Travellers will have the option of going to Moscow via Riga or via Warsaw. In Moscow there will be a change of trains, and baggage will be checked through to destination.

Consulting Engineers in China.—The China Industrial Development Association recently organised with headquarters at No. 87 Rue d'Ypres, French Concession, Tientsin, is a pioneer firm of Chinese consulting engineers. The association is incorporated as a limited concern with the following objects: (1) to assist in the organisation of industrial enterprises, such as designing and making estimates, investigating and adjusting accounts and supervising works; (2) general brokerage on merchandise; (3) introducing investments, mortgages and expert service for various industries; (4) to conduct special researches and compile data for any particular industry, (5) to answer industrial inquiries; and (6) to secure official registration for new companies and trademarks. A score of returned students from abroad, specialised in chemical, electrical, mechanical, mining and civil engineering as well as expert architects, designers, accountants, lawyers, draftsmen, cotton-mill experts and dyeing experts are in charge of the various departments of the association, which is publishing a weekly under the name of the 'Industrial Mirror' as its official organ. Consulting engineering is an established profession in all modern industrial countries, but this association is the first of its kind in China, and answers the crying need of modern industry.

Asbestos Trade in Peking.—Asbestos is produced in many places in Chihli Province, Yinyehling, at Miyun, Hotzechien, at Changping, Hungmeichang, at Fangshan, Yichow, Laishui, Hwailu and Tsingsing being the most noted. The use of asbestos was not known to the local population until an asbestos company of Tientsin sent agents to Hotzechien to collect the material. There are at present only two asbestos companies in Peking, Pu Tsi and Siang Ta who collect asbestos at Yichow, Laishui, and vicinity. Chifengling, a hill 45 *li* to the northwest of the Yichow station, Chwanshuikow, at Yichow, Yangmeitung, Shuichwankow, Tsaochang and Lengshuichien, at Laishui, are rich in asbestos. It is dug by the farmers at their leisure and sold to the asbestos companies of Peking and Tientsin. The mineral is conveyed by mules from the place of production to Liangkochwang, whence it is shipped to Peking by rail. The distance between the mines at Laishui and Liangkochwang is 180 *li* of mountainous road and it takes five days to complete the journey. The asbestos with long fibers is used for manufacturing cloth, that with shorter fibers for padding cushions and pillows and that with the shortest fibers for making wall plaster. The Pu Tsi Asbestos Factory was started in Peking in 1924 by Lin Pu-shen, a native of Anhwei, with a sales department at Shunchimen Ta Chieh, producing asbestos cloth, ropes, boards, (used as an outer cover for steam heat pipes), plaster, cushions, pillows and material for wadding. Asbestos cloth two feet wide, is sold at 70 cents per foot, plaster at $7.5 per 100 catties, and wadding materials of five grades, at 20, 30, 40 and 50 cents per lb. The Siang Ta Asbestos Factory is located at No. 3 Tsaoliaopu Hutung, Hsichiaochang, inside Hsichimen. It is a new establishment organized by Chin Tse-ming and produces only wadding and plaster, sold through Hwa Lu Co., at Fuchien Chieh, Peking. The plaster is of three grades, at $7.5, $6.5 and $5.8 per 100 catties respectively.

Liu I Weaving Factory, Shanghai.—The Liu I Weaving Factory, 256 San Yang Li, San Yang Road, Chapei, Shanghai, is increasing its production to meet the demand for woollen and knitted goods for winter wear. The company is engaged chiefly in manufacturing woollen or knitted shirts, sweaters, underwear and scarves. The factory maintains five departments, weaving, knitting, dyeing, spinning, and tailoring. The concern is a partnership of Hu Hai-chiu and Chen Hao-chu. It was established in 1925.

Motor-bus Competition in Java and Sumatra.—Motor-bus competition along certain sections of both private and State railway lines in Java and Sumatra, according to recent reports, appears to be assuming larger proportions.

The Pasoeroean Steamtram Co., Java, has endeavored to overcome this competition by inaugurating a similar automobile service in addition to the steam trams it operates; for this purpose it has placed an order abroad for four motor-busses.

Allied Machinery Company in Japan.—In his remarks to the stockholders at the annual meeting of the American International Corporation, Mr. Matthew C. Brush, president of the corporation, said: "Your corporation has disposed of its interest in all of its wholly owned subsidiary companies, except Allied Machinery Co. of America, in which instance arrangements to dispose entirely of the European branch of the business are in process. It is expected that the plan will be consummated within the next two months on a basis very satisfactory to the management. This will leave the Japanese branch of the Allied Machinery Co., which is continuing to operate and for which your corporation has received several tentative offers."

The Wireless Station at Pehchiko.—Nanking, was opened on November 28th last, and it is now in direct communication with most of the other Chinese stations. The cost for commercial messages is the same as that for telegrams.

The Telephone Administration of Tientsin is planning the installation of modern automatic telephones in the foreign concessions. The work of installing the equipment will commence almost immediately.

In order to facilitate the transmission of military dispatches, the provincial authorities of Shantung have decided to install a long-distance telephone system throughout the province, commencing with the ten districts in the Tsinan circuit. Preparations for the installation are now being made.

The long-distance telephone service between Mukden and Chengkiatun has now been opened to the public.

Osaka Sanctions Fast Line Scheme.—A bill sanctioning the establishment of the Nippon Electric Railway Company, Ltd., has been adopted by the Osaka municipal assembly. The bill was introduced the Osaka Prefectural Government. This company is being promoted under the auspices of Baron Seinosuke Goh, Mr. Kaiichiro Nezu, Mr. Keisuke Miyazaki, vice-president of the Daido Electric Power Company and other leading businessmen and financiers of Tokyo and Osaka.

According to the plan, this firm aims to connect Tokyo with Osaka by an electric line. The line will start at Shibuya, a Tokyo suburb, and terminate at Nakanocho in Osaka. The Osaka municipal assembly changed the terminus to Ichome, Enoe-cho, Higashinari-ku, Osaka, and then adopted the plan.

The firm is to be capitalized at Y.250,000,000, a quarter paid up. The plan was also presented to the Tokyo Prefectural Assembly last year but it so far has failed to discuss it either in the prefectural or municipal assembly. The proposed construction of an electric line between Tokyo and Osaka is a gigantic enterprise. The promoters intend to shorten the trip between the two cities by operating express electric trains. The most difficult problem confronting the plan is that whether the Imperial Government Railway authorities will allow it.

Yao Hwa Electric Light Plant, Hsuchow.—The Yao Hwa Electric Light Plant, Hsuchow, Kiangsu Province, was started in 1920 under individual ownership; later, it was reorganised into a partnership company with Chang Hsiao-chien as manager. It is located outside Tungkwan, with an office in Kulow-chieh. It is equipped with three dynamos, having high tension, tri-phase and three-wire alternating current, of which one of 250 kilowatt power and one of 30 kilowatt power are in operation. A third one, of 250 kilowatt power, is not in use. Steam engines of some 15 h.p. each are employed. Out of the three boilers in the plant, only a large one and a small one are in operation, the remaining large one still lying idle. The plant consumes six tons of coal a day, supplied from the Chung Hsing Coal Mining Co., at the price of $13.60 per ton. It is supplying current to the public for 13,200 lamps of 30 candle power each. About 20 workmen are employed.

Japanese Cement Association Restriction.—The Japan Cement Association has reduced the ratio of production restriction of cement for April and May, as a result of the recent greneral meeting held in Osaka. The maximum restriction for April and May has been reduced to 15 per cent. and the minimum to 5 per cent. The reason for restriction reduction is in that, if it is entirely withdrawn, it will be difficult for the cement companies to enforce the restriction again during time of depression. Also the cement export market is dull.

The cement business promises favorable results this year. The highest restriction of production after December, 1926, was reduced to 20 per cent. from 34 per cent. in November. The net restriction ratio is 13.3 per cent., as the regular monthly 48 hour holiday is included in it. Moreover, additional production is permitted for export.

The December production of 1,798,000 barrels is regarded as the fullest production. Suppose this amount is produced every month this year, the annual production for 1927 will total 20,576,000 barrels. The Minato factory of the Iwaki Portland Cement Company is expected to be opened next June. Its semi-annual output of 400,000 barrels added, the entire production is estimated at 22,000,000 barrels.

Japan Plans to Extend Domestic Machinery Production.—Acting under instructions from the Japanese Government, specially appointed committees in Tokyo, Osaka, and Nagoya have been investigating the problem of extending the development of the domestic machinery industry. Plans of action have now been formulated regarding precision machinery, power machinery, spinning machinery, and machine tools and equipment.

The Department of Commerce and Industry is to make arrangements for instructing workmen in the use of precision machines in those Government and private mills where a high degree of efficiency is maintained. Plants with superior efficiency are designated for this work in order that the Government may take measures to maintain a capacity output and assist in effecting improvements in manufacturing methods. The Government is to be asked to use its influence in establishing guilds, and other associations composed of manufacturers of precision machinery.

Measures are to be taken to develop the manufacture of the larger types of machine tools. Vigorous efforts are to be made to extend the manufacture of precision machines used in the production of woodworking machinery, grinding and milling machines, automatic drills, gun-barrel lathes, etc. Standard grades of precision machinery are to be established and subsidies given for equipment coming up to these standards.

The production of the following power-generating machinery calls for especial encouragement at this time: Water-tube steam boilers, steam turbines, gasoline engines, Diesel engines, and water wheels. The tariff on these classes of machinery is to be revised and subsidies arranged to encourage their manufacture. Experimental work looking toward their manufacture is to be arranged by the Government. A list of approved manufacturers will be prepared by each department of the Imperial Government.

Well-equipped manufacturers are to be given subsidies for the production of spinning machinery and experimental work. The co-operation of manufacturers and spinning companies is to be encouraged with a view to unifying the types of machinery employed and to encourage the use of domestic machines. An effort will be made to expand sales by developing foreign markets in order that factories may operate at capacity.

West Java's Road Program for 1927.—The Governor of the Province of West Java has submitted the following information regarding the program for road improvements and extensions during 1927:

Although the plan for the program as a whole is not yet definitely formulated, its carrying out is estimated to require around 24,000,000 florins. The item of 400,000 florins that has been included in the proposed budget for 1927 for the execution of the provincial road program will be used only for work on the seven most necessary roads, which may be completed within the next few years. These seven projects are given below, in the order of thier rank.

1. Tjiawi (in Koenigan regency) northwest to Sindanglaja (near Tjisalak), thence westward to Tjiandjoer, over the Poentjak Pass.
2. Poerwakerta southeastward to Segalaherang, Tjisalak, Tjikramas, Soemedang and beyond.
3. Laboean to Anjer Lor, along the coast of Sunda Strait.
4. Tjitjoeroeg (in Soekaboemi regency) southeastward to Tjilatjap on the south coast of Central Java.
5. Tjikalong (in Tjiandjoer regency) northeastward, via Tamiang, Soekamandi, Tjiasem, and Pamanoekan, to Sewoe on the north coast.
6. Palaboean Ratoe (on Wynkoops Bay), across the island, via Tjisalak, to the Bay of Cheribon (Tjirebon).
7. Paroengpandjang to Serpong.

Kwang Yi Silk Weaving Mill, Shunyi, Chihli.—The Kwang Yi Silk Weaving Mill, Pailanghostun, Shunyi, about 5 *li* north of Kaoliying and 60 *li* northwest of Peking, was started in 1923 by Li Tao-hsien with five wooden looms. At the end of 1924, it was equipped with an additional iron loom. The wooden looms are foot-operated, and similar to those used in Nanyang, Honan Province. They are capable of turning out half a piece of silk a day. The iron loom is similar to those commonly used in cloth weaving mills in Peking, having a daily productivity of one piece. Mill hands number nine, the wooden loom operators coming from Nanyang, and the iron loom operators from Peking. The fabrics turned out are chiefly brocaded crepe de Chine and pongee (occasionally also a figured silk of the *hwa sze ko* variety, the crepe measuring 1.5 *chih* (Chinese foot) and the pongee 1.6 *chih* in width, both 52 *chih* long in a piece. They are consumed in Peking and Mongolia. The mill consumes five catties of raw silk a day, supplied principally from Mr. Li's own cocoonery and to a small extent from Chifangtsun, in the vicinity of Tsinghwachen, Honan Province. Mr. Li has been operating a cocoonery for 12 years. His mulberry plantation covers 40 *mow*, in which only the Huchow variety, or *hu sang*, is cultivated. Chifangtsun is the center of distribution of raw silk from Tsehchow, and the vicinity of Hopeh, Shansi Province. The Kwang Yi Mill takes orders from silk brokers who deliver the goods to Shunyi through the mails, there being a dozen silk brokers and a post office in Chifangtsun.

Daido Will Boost Its Capitalization.—The proposed increase of capitalization by the Daido Electric Company has been approved as a result of the recent director's meeting held in Osaka. The company's capitalization is to be increased to Y173,000,000 by Y60,037,000 in 1,271,850 shares. Of these, 1,200,740 shares are to be alloted the present shareholders at the ratio of one to two on May 16, 1927. The remaining 71,110 shares are to be presented to directors and officials, 31,110 to the former and 40,000 to the latter in recognition of their services to the company.

The capital increase is necessitated by the extension of its business enterprises in connection with the Tenryugawa Electric Powers Company and the Showa Electric Power Company, in both of which the Daido Company is heavily interested. Besides, the company plans the erection of seven power stations along the River Kiso, for which an enormous amount of funds will be necessary. The power stations in project are as follows:—

Stations	Generating power k.w.
Nishino	5,200
Otaki No. 1	5,200
Otaki No. 2	4,200
Nezame	7,350
Sakashita	5,050
Kasagi	17,000
Nishikizu	18,000

Imperial Chinese Paper Mill.—A dividend of 22 per cent. per share plus 8 per cent. official interest for 1926 was declared by the Imperial Chinese Paper Mill, 17 Rue Colbert, Shanghai, making a total of Tls. 30 per share. Payment began on April 11, 1927. The company is capitalized at Tls. 1,000,000 at Tls. 100 per share, bearing 8 per cent. interest per annum.

Japanese Sulphur.—The annual output of sulphur in Japan is estimated at 50,000 tons, about 85 per cent. of which is produced in Hokkaido. The price for sulphur f.o.b. Muroran or Aomori during recent years has been low, because of competition with the imported product, and the producing companies have not been financially successful. At present, however, quotations are somewhat higher as a result of a greater demand from paper mills, active exports to China and other countries, and the closing of the Okushiri mine in Hokkaido, which has been producing 15,000 tons per year. Local companies are now reported as operating on a paying basis and it is stated that several mines will increase their output during 1927.

Tokyo Gas Company Plans to Erect Two New Tanks.—The Tokyo Gas Company has decided to erect two large gas tanks in its Senju plant, one capable of containing 4,000,000 cubic feet and the other 2,000,000 cubic feet. Another 2,000,000 cubic feet tank also is to be erected in the compound of its Omori plant.

The gas supply in Tokyo is rapidly increasing recently. Last month the supply totalled 32,000,000 cubic feet, in contrast to 27,000,00 cubic feet for the same period of last year. This is an increase of 20 per cent. in a year, while the annual increase used to be about 15 per cent. until 1925.

Liehshan Coal Mines, Anhwei.—The coal mines at Liehshan, Suchow, Anhwei Province, were exploited before the establishment of the Republic, but were not worked on a large scale until 1914 or 1915, when the Pu Yi Liehshan Coal Mining Co. was started by Ni Ping-wen with Chinese capital of $1,200,000. Liehshan is 40 *li* northwest of the Fulitsi Station by land. Up to the present, six shafts have been sunk by the company. Three are new shafts, two are on the south section of the mines, yielding anthracite of good quality, to the amount of over 500 tons a day, and the other one is on the north section, yielding bituminous coal of somewhat inferior quality to the amount of over 100 tons a day. Hand labor is employed in excavation, but the coal produced is raised out of the pit by cages. Workmen also descend to the coal level in cages. Coal is conveyed by light railway down the hill, further transported from the foot of the hill to the river mouth at Fulitsi, a trip of 50 *li*, by a tributary of the Suiho, and thence again by light railway to the Fulitsi Station, 3 *li*. The company has a transportation department about a *li* from the station, and accessible by another light line. Work is carried on day and night, but divided into three shifts of eight hours each. Workmen number between 700 and 800. They work by shifts under the control of foremen. They are paid according to the output of the whole shift. This works out at about 1,000 cash a day. The wage of a foreman is about $20 a month. Liehshan coal is consumed principally in Anhwei and Kiangsu. The company's agents in various towns must find a bond before they may do business. Those in Hsuchow pay $8 a ton for anthracite but sell at the present retail price of $10 a ton. The cost of transportation from Fulitsi to Hsuchow by railway (60 cents per ton) is borne by the company; the agents need to pay only a small amount for conveyance from the Hsuchow Station to their depots, say, at 10 cents to 20 cents per ton. The net profit obtained by these coal agents on the sale of one ton of anthracite is therefore about $1.80 or $1.90.

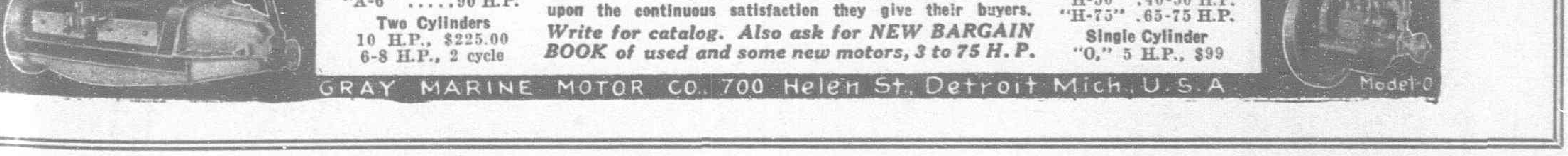
Radio Broadcasting.—The Chinese government bar against the use of radio in Manchuria except for military purposes has been lowered. During 1927 at least two broadcast stations will be built. Contracts have been let to a French firm for a two-kilowatt plant at Mukden to operate on 250 to 550 meters and an American concern is to install a one-kilowatt station at Harbin.

Waterworks in Chungking.—The authorities of Chungking, Szechwan province, are planning the installation of water works in the city. A company is being organised with private capital under official supervision. It is estimated that $600,000 will be required to instal the necessary machinery and to meet other initial expenses. The funds will be raised by public subscription or by floating a loan, according to a prospectus recently drawn up and circulated among the local inhabitants.

Railway Engineering Works in Kirin.—With a view to securing contracts for railway construction in Kirin province, Chinese and Japanese have orgainsed the Kirin Hing Yeh Railway Engineering Works in Kirin, the provincial capital, with a capital of 10,000,000 *yen*, shared equally between the Chinese and Japanese promoters. One quarter of the authorised capital was paid up upon the inauguration of the company, which took place on December 21, 1926.

Shanghai Municipal Electricity Department.—A net profit of Tls. 2,205,490 was realized by the Electricity Department of the Shanghai Municipal Council in 1926. This represents an increase of Tls. 359,040 over the estimated profit of the year. The total sales of electricity for all purposes were 408,245,810 kilowatt-hours and the revenue from sales of electricity, hire of motors, etc., Tls. 10,051,221. The gross profit after allowing for depreciation was Tls. 3,930,539. There were 43,378 consumers at the end of the year as compared with 38,932 at the end of 1925 or an increase of 4,446. The Department employed 188 foreigners on its staff, 104 Russians, and 3,360 Chinese in 1926; for 1925, the figures were 179, 113, and 3,035 respectively. A total of 226,190 lamps were in service within the Settlement at the end of 1926.

Shanghai-Hangchow Road.—A modern highway from Shanghai to Hangchow is planned to be constructed for motor traffic. Surveying has been completed. The projected road is to run through a number of densely populated towns and cities lying east of the Shanghai-Hangchow Railway. It will start from the neighborhood of the Kiangnan Arsenal in Shanghai to Minghong, following the existing Shanghai-Minghong motor road. From Minghong the road is to continue in a south-eastern direction through Tinglin and Changyen until it crosses the Chekiang border line at Yachien Pinghu district. From Yachien, it will pass through Chapu, a seaport belonging to Pinghu, Haiyen and Haining. From Haining it will follow the existing Haining-Hangchow motor road to Hangchow City and farther on to Nansingkiao, on the left bank of the Tsien Tang River. On the opposite bank of the river, a motor bus service is already in operation between Shaohing and Siaoshan. So after the completion of the projected highway, quite a number of prosperous districts not lying within the Shanghai-Hangchow Railway zone, will be brought into closer contact with Shanghai and Hangchow. Though the highway covers a long distance, the work of construction is not difficult. On both the Shanghai and Hangchow sides, two motor roads, the Shanghai-Minghong Road and the Hongchow-Haining Road, are already in existence. It is only necessary to connect these two lines. A special bureau will shortly be organised.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Kaiping-Fuchow Railway.—Various interests in Fengtien province have formed a syndicate to build a light railway from Fuchow to Kaiping, a distance of about 200 *li* in South Manchuria, with a view to facilitating salt transportation. Official permission has been obtained and construction work will be started in the spring, it is reported.

Students to Build Roads.—By order of the Civil Governor of Kweichow province, all students of Kweiyang, the provincial capital, over 15 years old are required to devote one day every week to road building. Every school is assigned a section of a road, on which the students are to work from 9 a.m. to 4 p.m. on Saturdays. The studentworkers will be awarded special honors upon completion of the roads.

Chinese Eastern Railway.—A total amount of 256,000,000 poods of freight and 3,250,000 passengers was carried by the Chinese Eastern Railway in 1926 as against 207,000,000 poods and 2,454,000 persons in the previous year. The following table shows the comparative figures of net profit made by the railway in the past years :

1912	4,918,000 roubles
1913	7,896,000 ,,
1924	15,625,000 ,,
1925	2,223,600 ,,
1926	2,500,000 ,,

Cement Manufacturers Plan 40 to 50 per cent. Reduction.—In view of the fact that the protland cement manufacturing industry in Japan, which has been hard hit by business depression in general, again has been dealt a severe blow on account of the moratorium, all the manufacturers are now planning a 40 to 50 per cent. reduction of products in order to regulate the stock.

All markets in this country are now sharing in a slackness, with a heavy decline of transactions, and as a result, the stock at present is more than 1,580,000 barrels, this being the highest figure for the past several years.

Rolling Stock on Government Railways.—According to statistics recently compiled by the Ministry of Communications, the Peking-Mukden Railway originally had 364 passenger cars, 4,412 freight cars and 236 locomotives, out of whcih, 176 passenger cars, 2,759 frieght cars and 52 locomotives have been transferred to other railways, while a number of cars belonging to other railways are now running on the Peking-Mukden line. On the Tientsin-Pukow line there were originally 385 passenger cars, 2,088 freight cars and 136 locomotives, of which 100 passenger cars and 539 freight cars have been taken to other lines, while a number of other railways' cars have been transferred to this line. Taken as a whole, however, the amount of rolling stock on both lines has been considerably reduced as a result of military operations.

Shanghai Waterworks Co., Limited.—A net profit of Tls. 614,246,45 for 1926 was realized by the Shanghai Waterworks Co., Ltd., 69 Kiangse Road, Shanghai,. The gross revenue for the year amounted to Tls. 2,021,947.50 as compared with Tls. 1,965,105.93 for 1925. The balance of working account amounted to Tls. 1,072,192.83 for 1926 ; the figure was Tls. 1,093,399.37 for 1925. An interim dividend of 10 shillings per share at exchange 2/11 5/8 was declared and paid on July 28 amounting to Tls. 112,948.16. A final dividend of 30 shillings per share at exchange 2/5 3/4 for the year was declared, amounting to Tls. 405,741.18. The average daily consumption for 1926 was 33,849,444 gallons as compared with 29,615,121 gallons for 1925, an increase of 14.3 per cent. The maximum daily consumption for 1926 was 44,688, 425 gallons, and 37,716,317 for 1925, an increase of 18.4 per cent, and the maximum hourly consumption for 1926 was 2,843,000 gallons as compared with 2,491,000 for 1925, an increase of 14.1 per cent. The abnormal increase in demand was due to the particularly hot summer and the unquestioned increase in waste. The company is capitalized at £1,000,000 with 40,236 shares of £20 each and 195,280 shares at £1 each. The company issued debentures for Tls. 2,000,000 at 8 per cent. interest in 1921, for Tls. 500,000 at 8 per cent. in 1922 and Tls. 1,000,000 at 7 per cent. in the same year, and for Tls. 500,000 at 6 per cent. in 1925.

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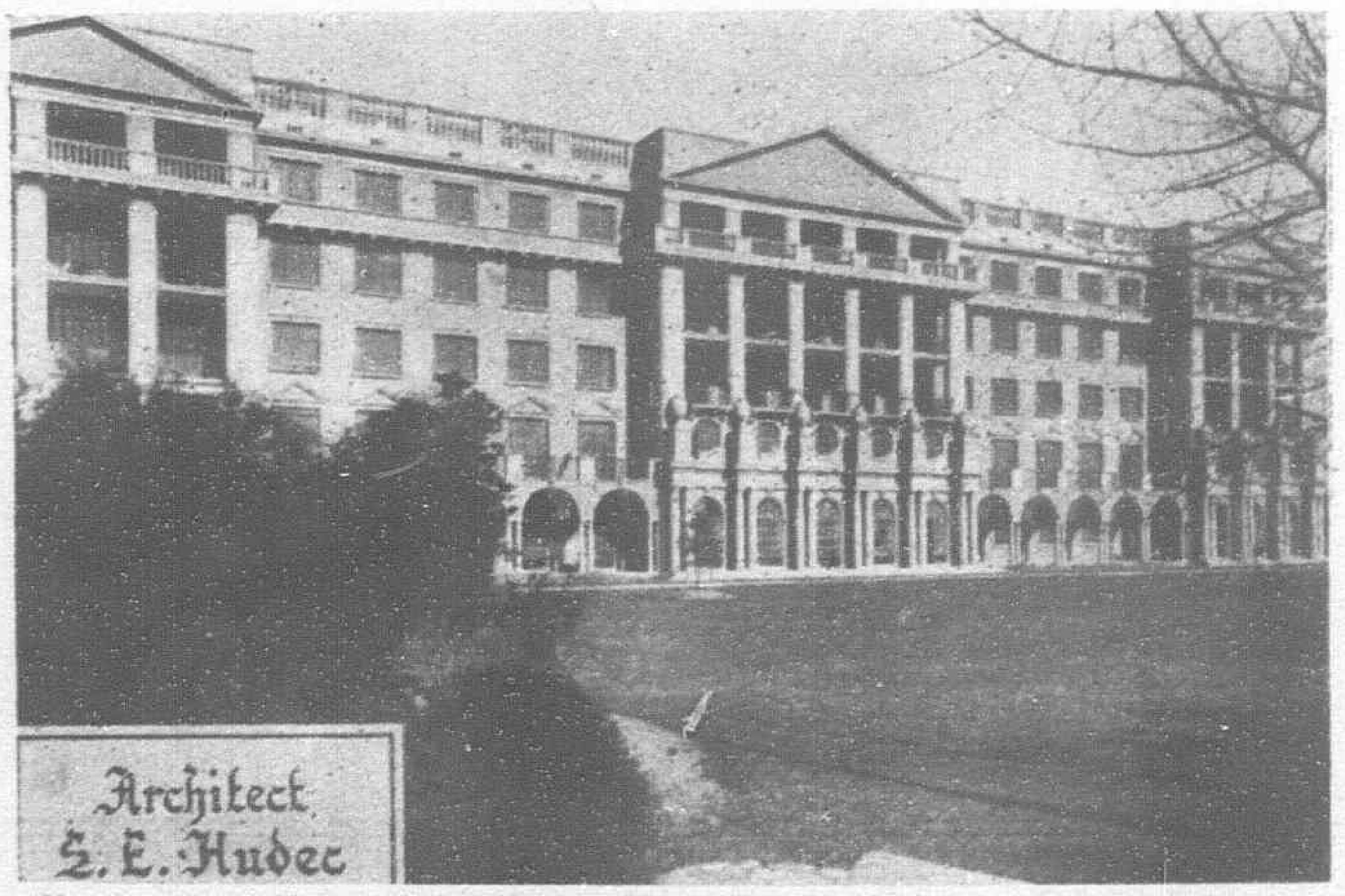

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